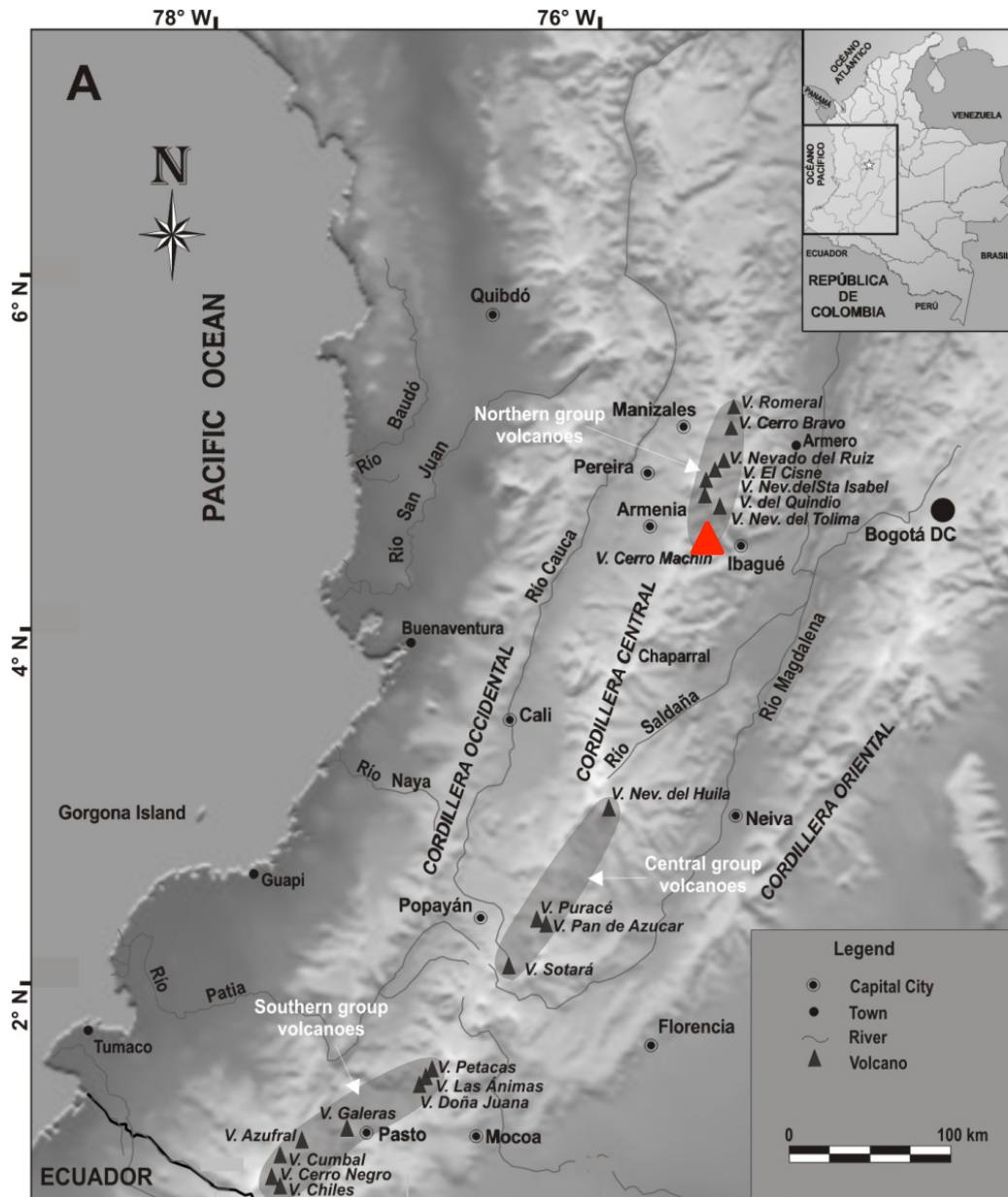




# SEISMOLOGICAL ASPECTS OF CERRO MACHIN VOLCANO

Milton Ordóñez  
Observatorio Vulcanológico y Sismológico de  
Manizales - Colombia



- 150 km W of Bogotá
- 17 km of de Ibagué (500.000 habitantes)
- 7 km of Cajamarca (20.000 habitantes)
- 4 km of Tapias
- 3 km of Toche











One of the most active volcanoes in Colombia.

Pyroclastic rings (2.4 km)

Lava domes complex

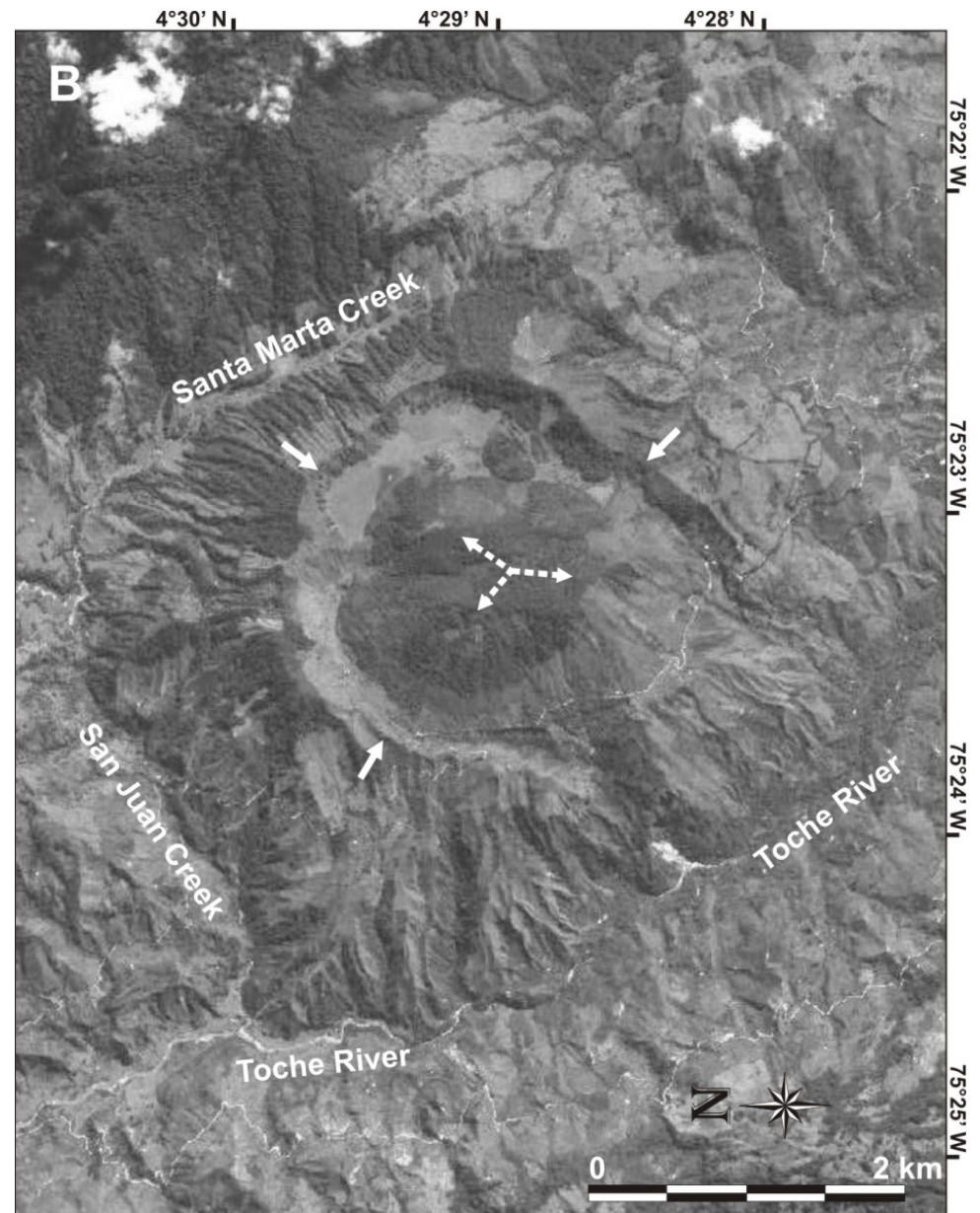
Dacitic composition

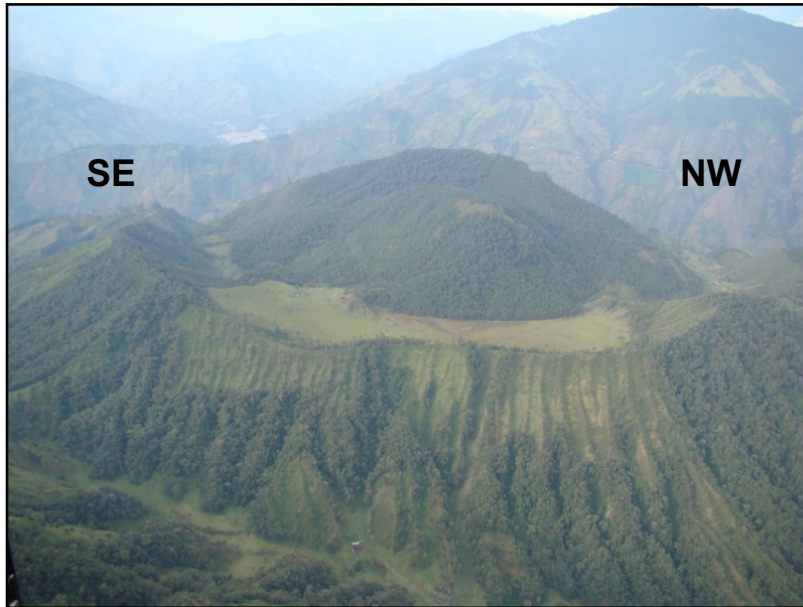
Plinian and Vulcanian eruptions

6 eruptions / 5000 años BC

Primary activity: pyroclastic falls and flow deposits

Secondary activity: lahars deposits



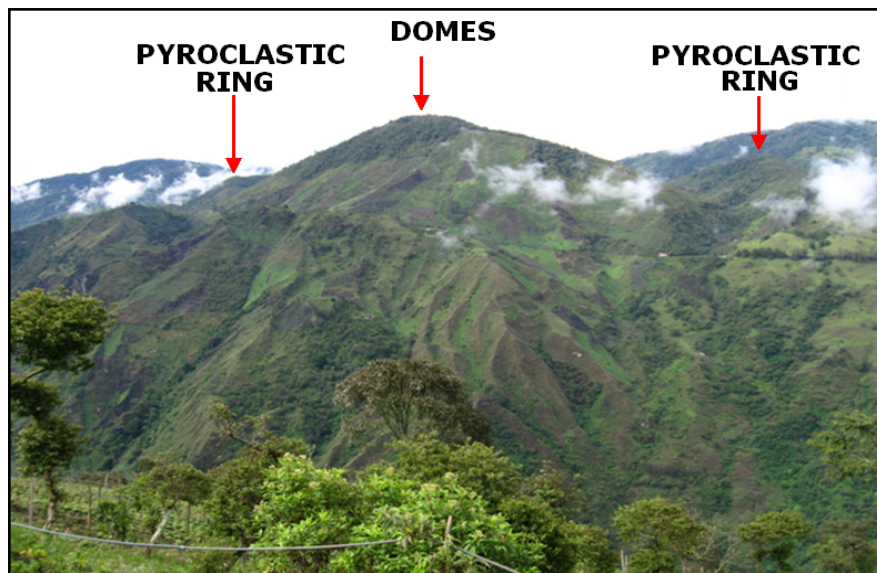
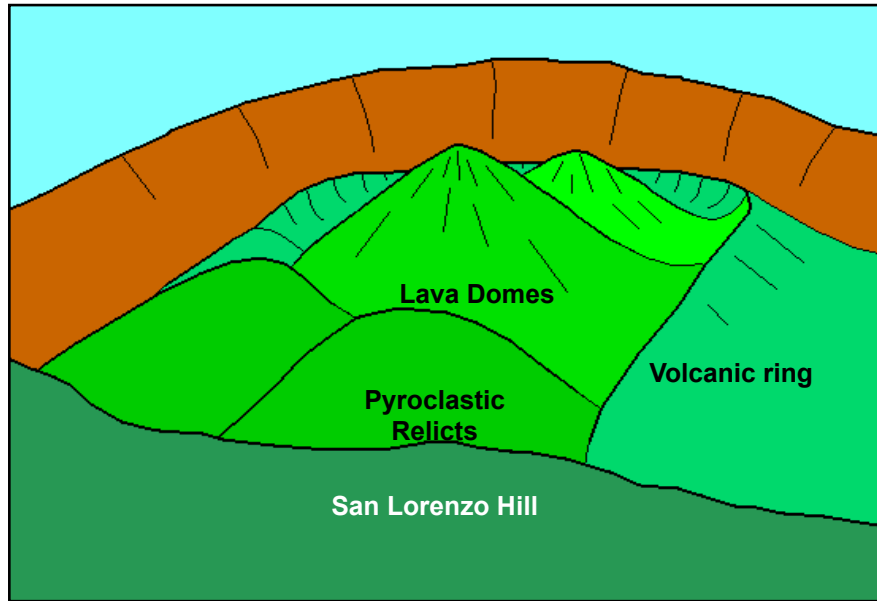






# NETWORK

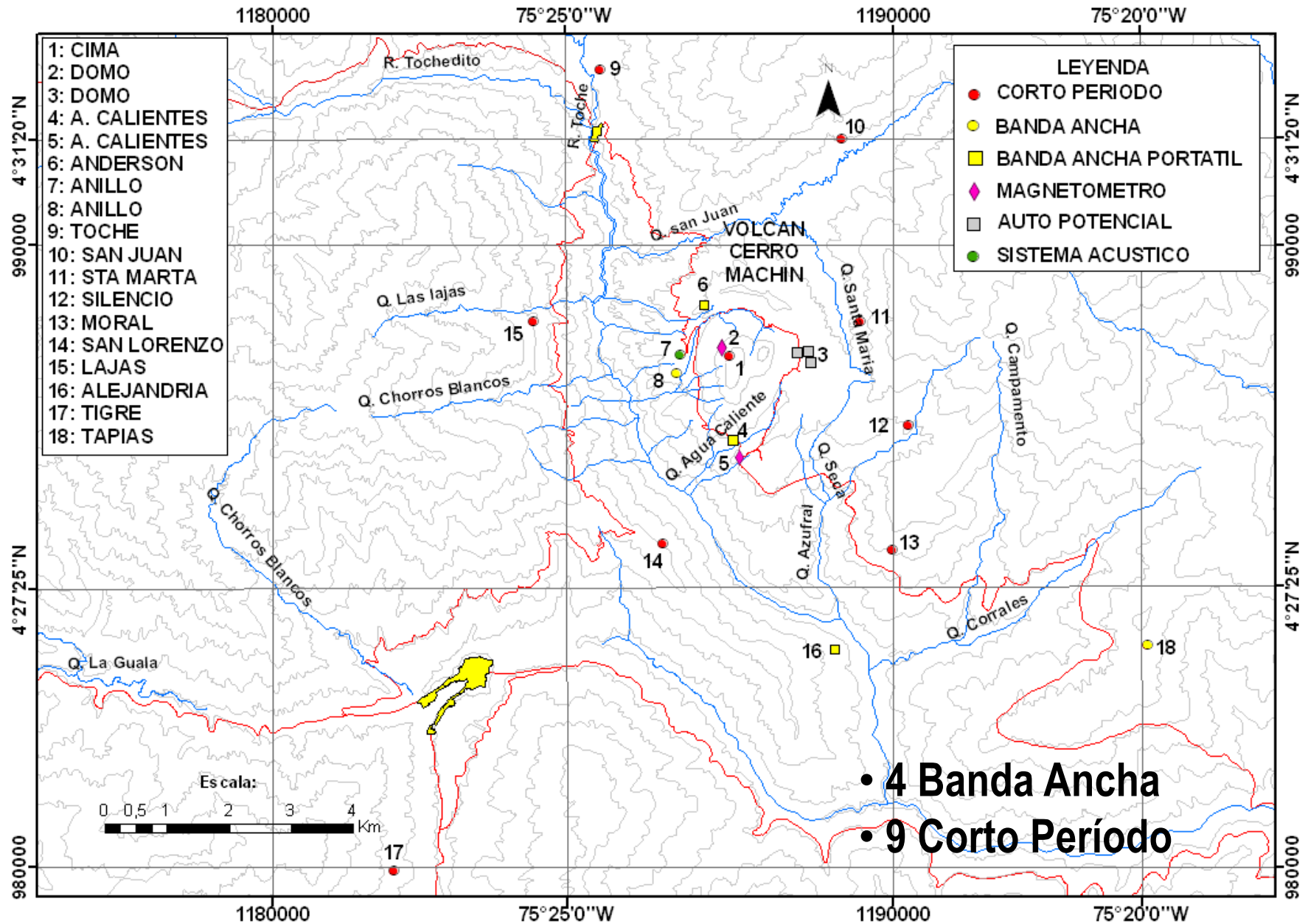
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# NETWORK

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# SEISMOLOGICAL STATION

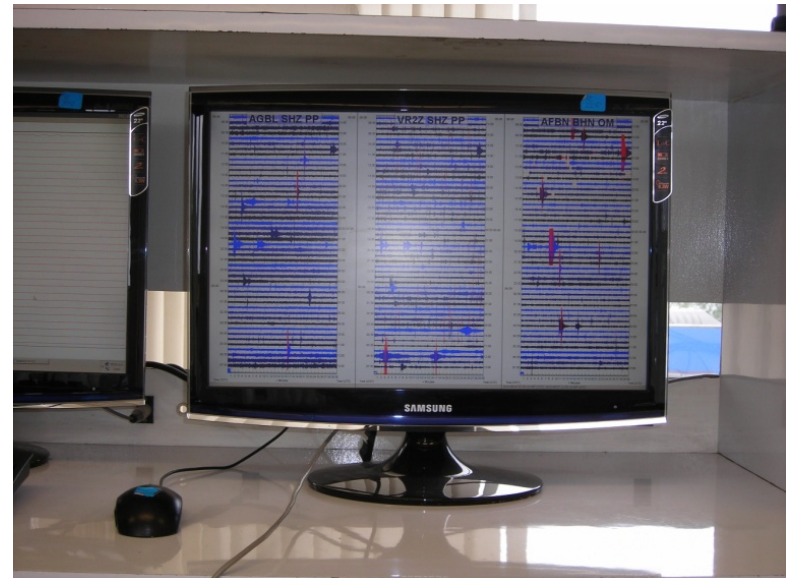
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# MONITORING ROOM

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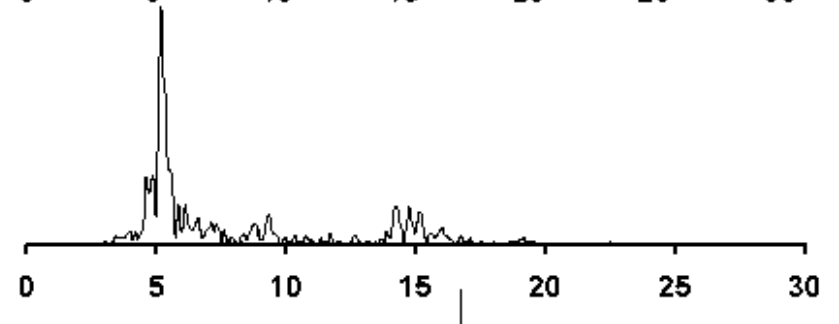
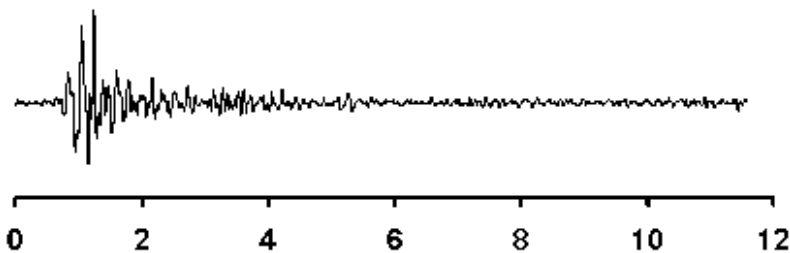
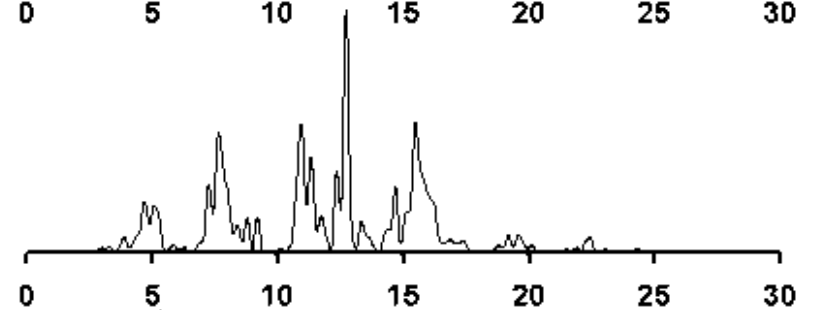
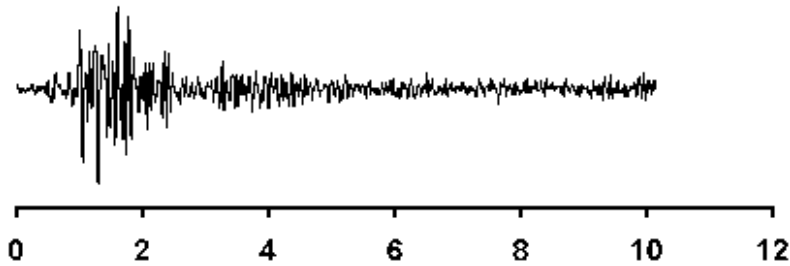
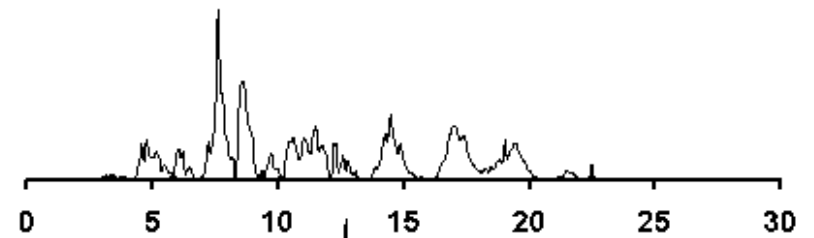
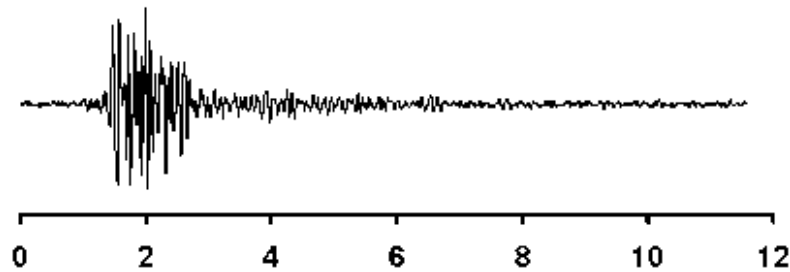






# LP EARTHQUAKES

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# VT EARTHQUAKES

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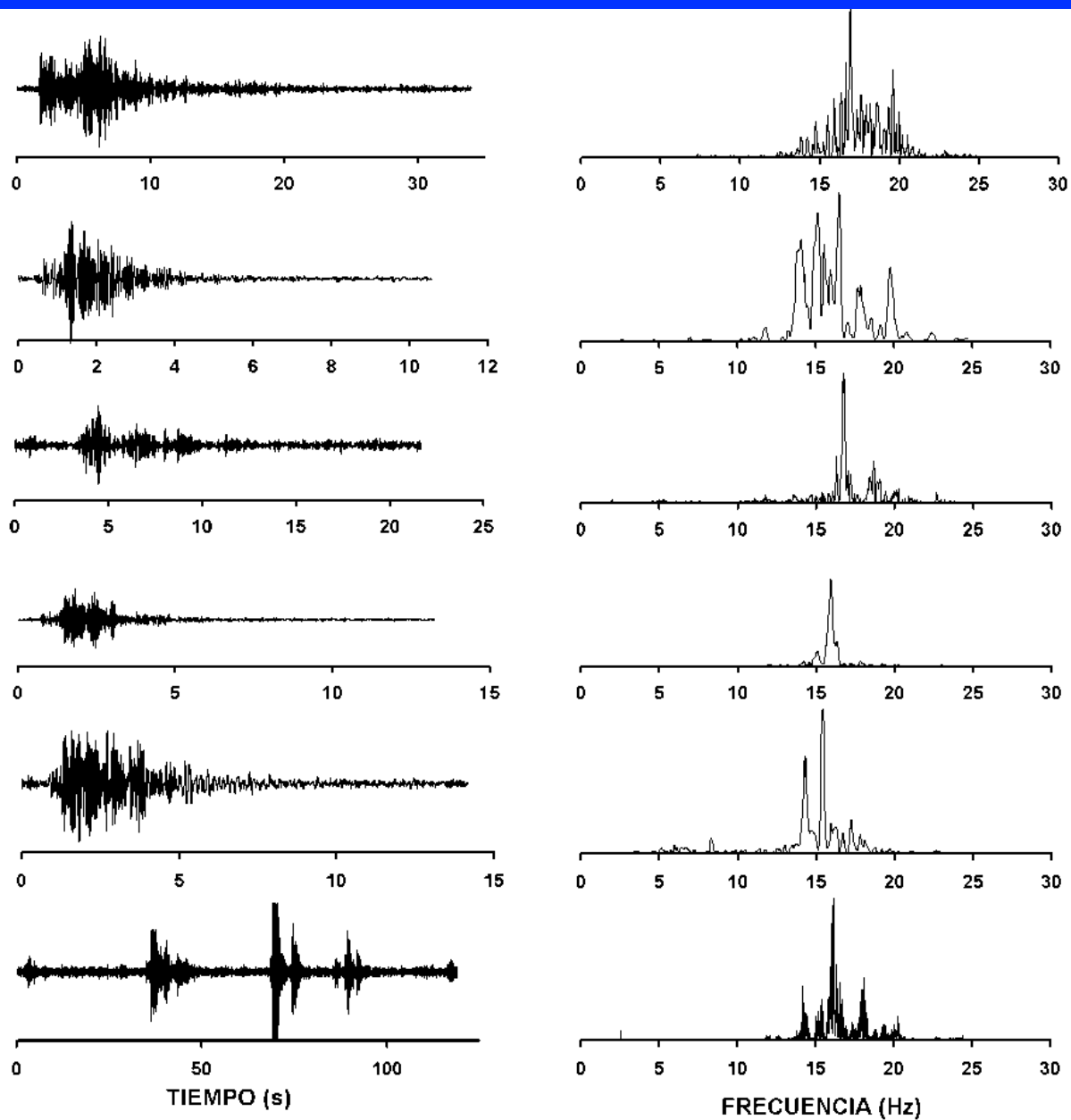


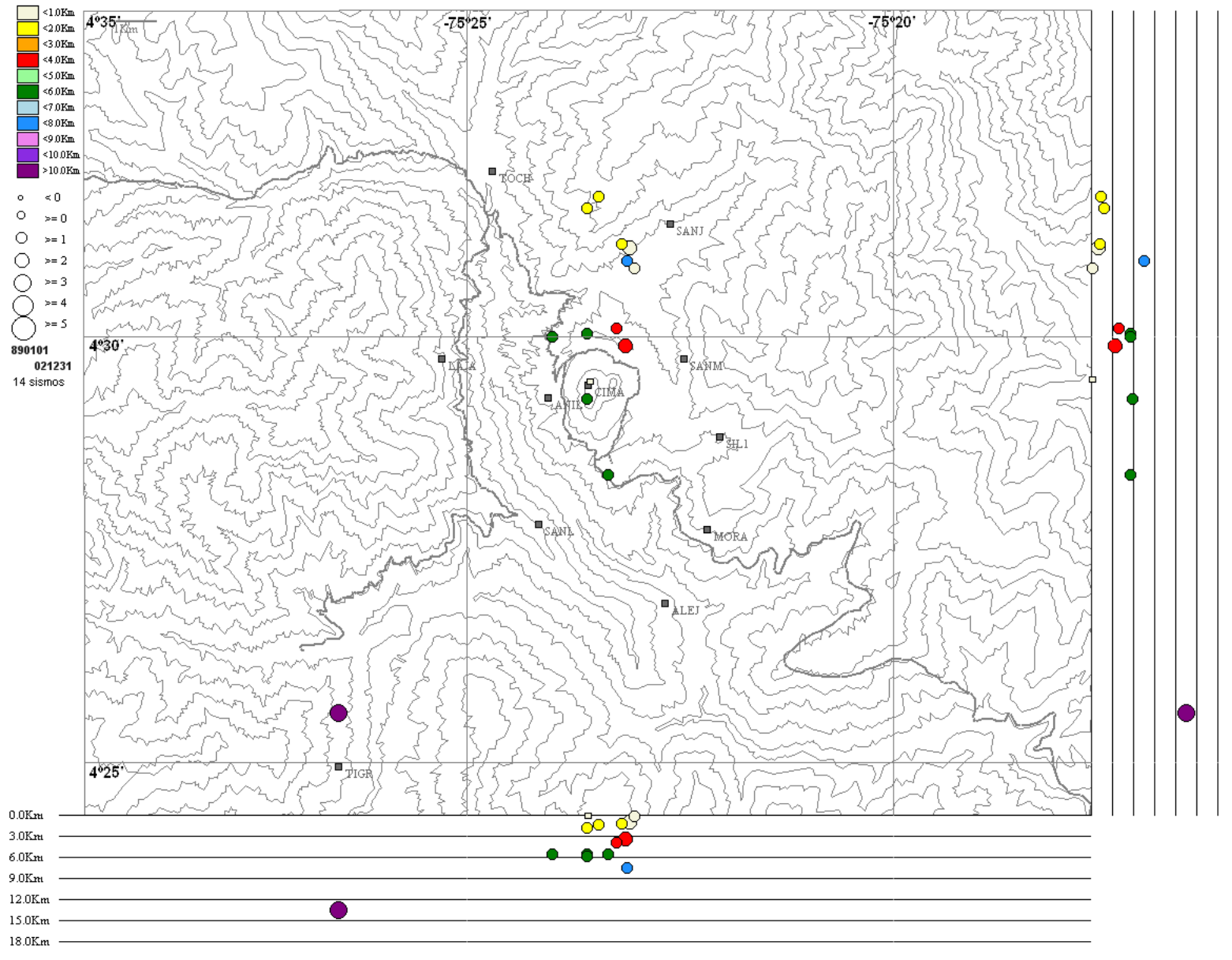
Figura 7





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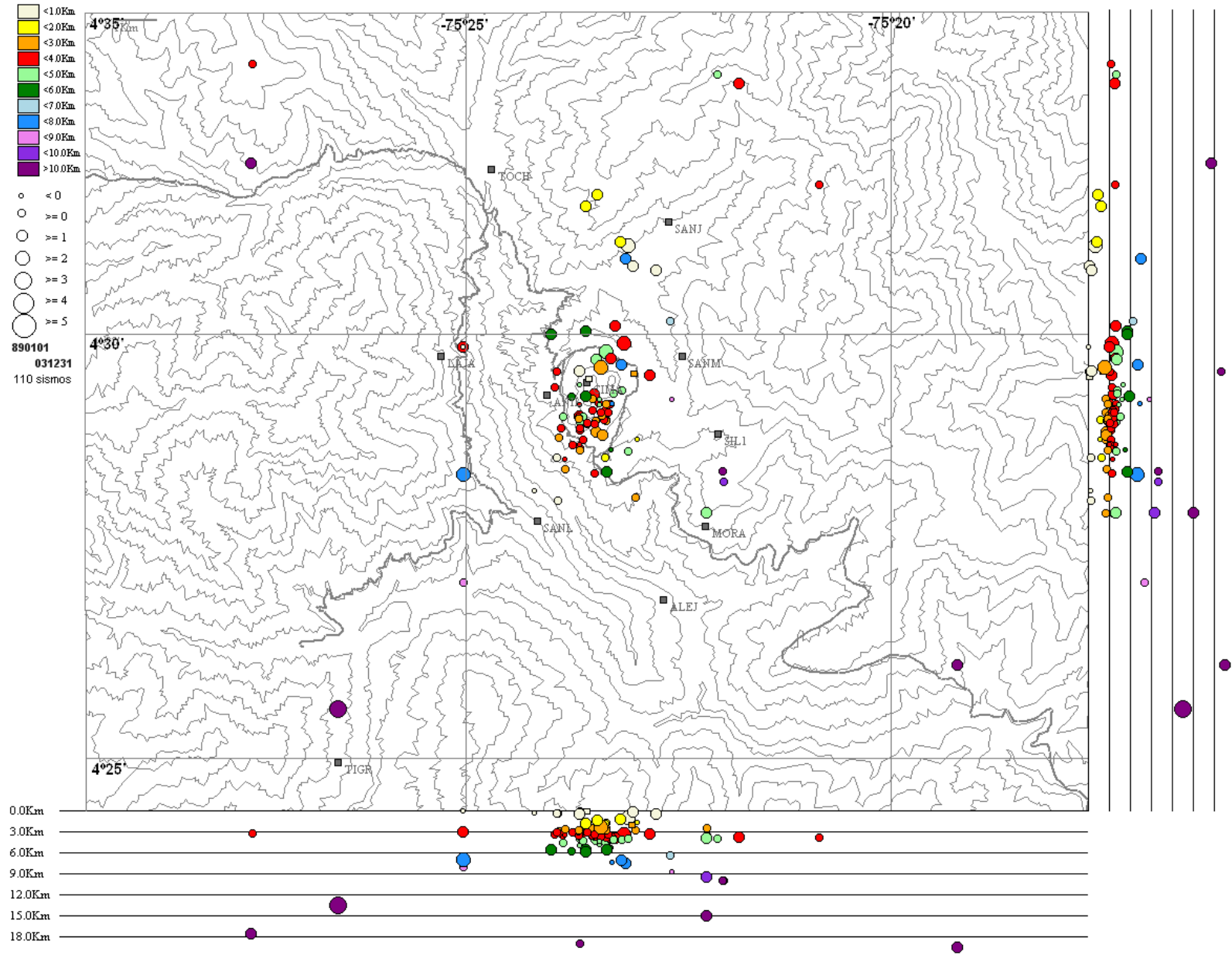
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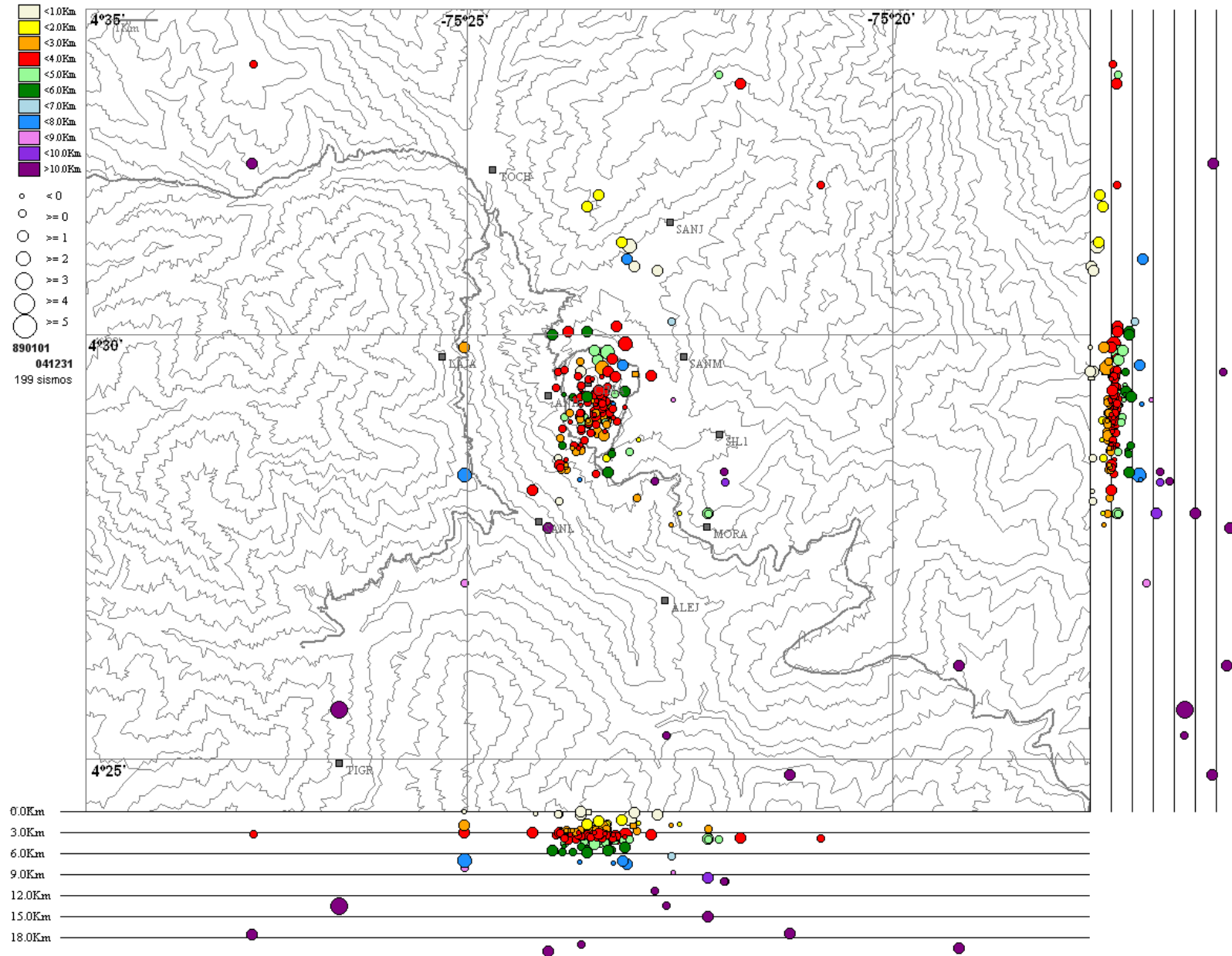
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# 2004

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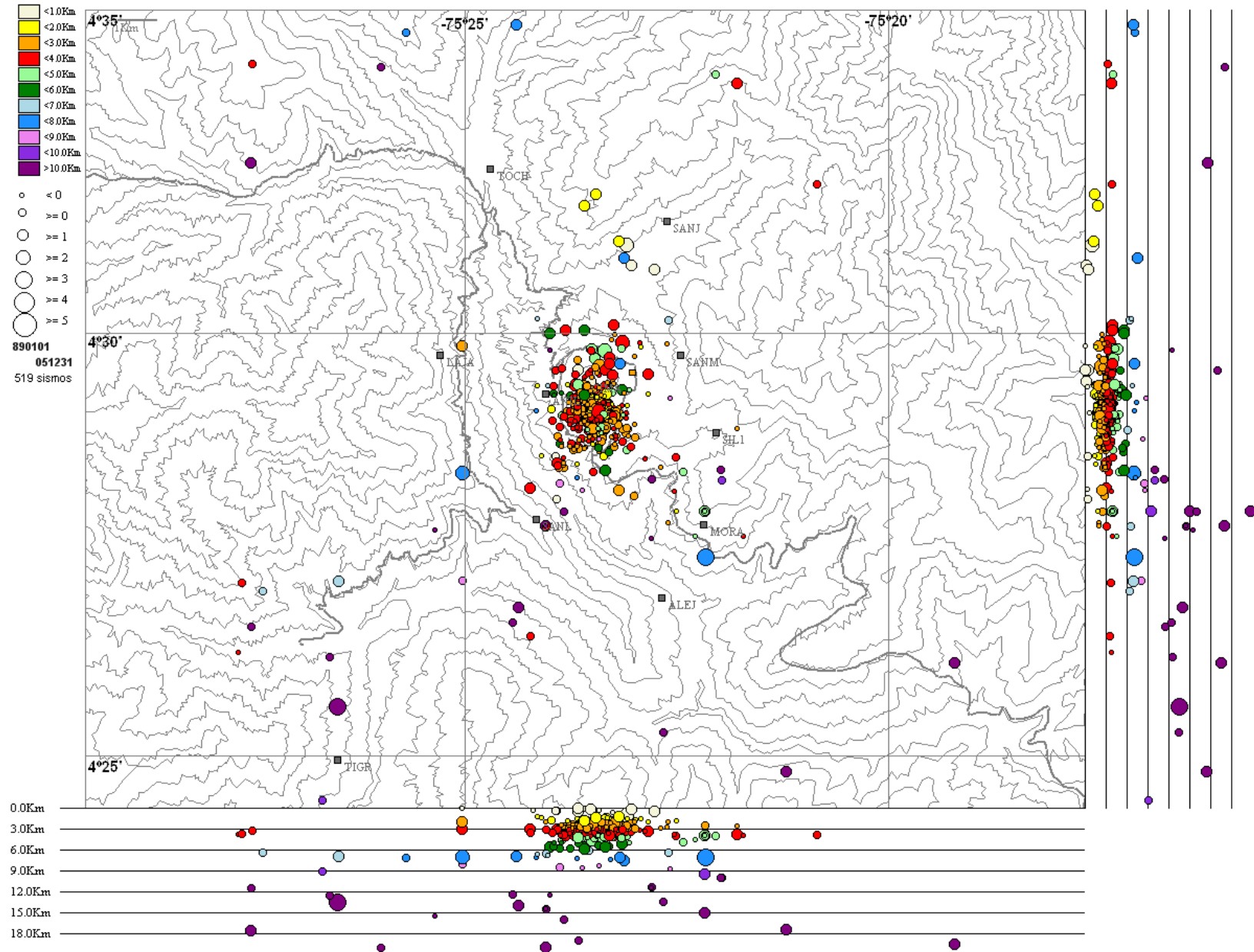






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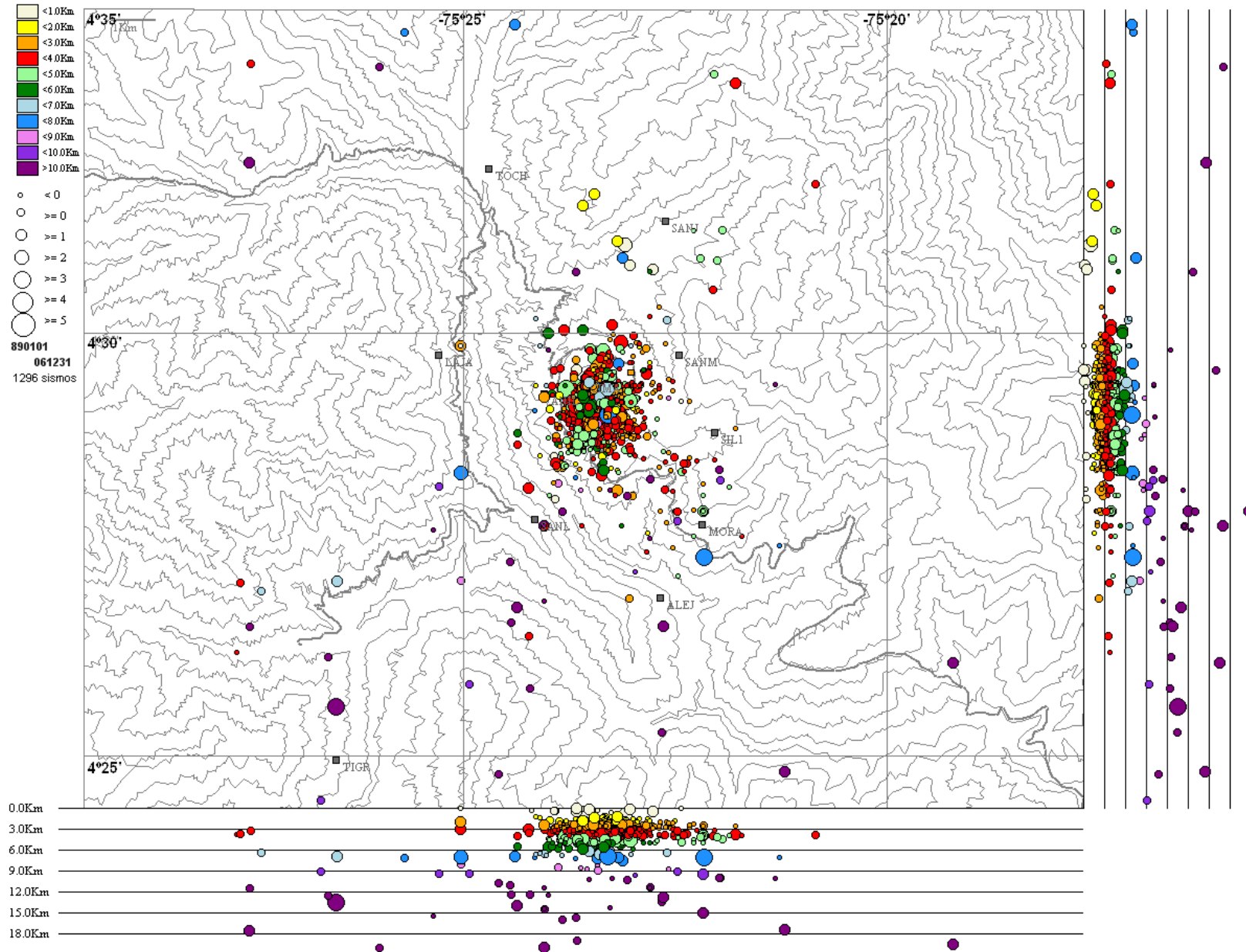
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# 2006

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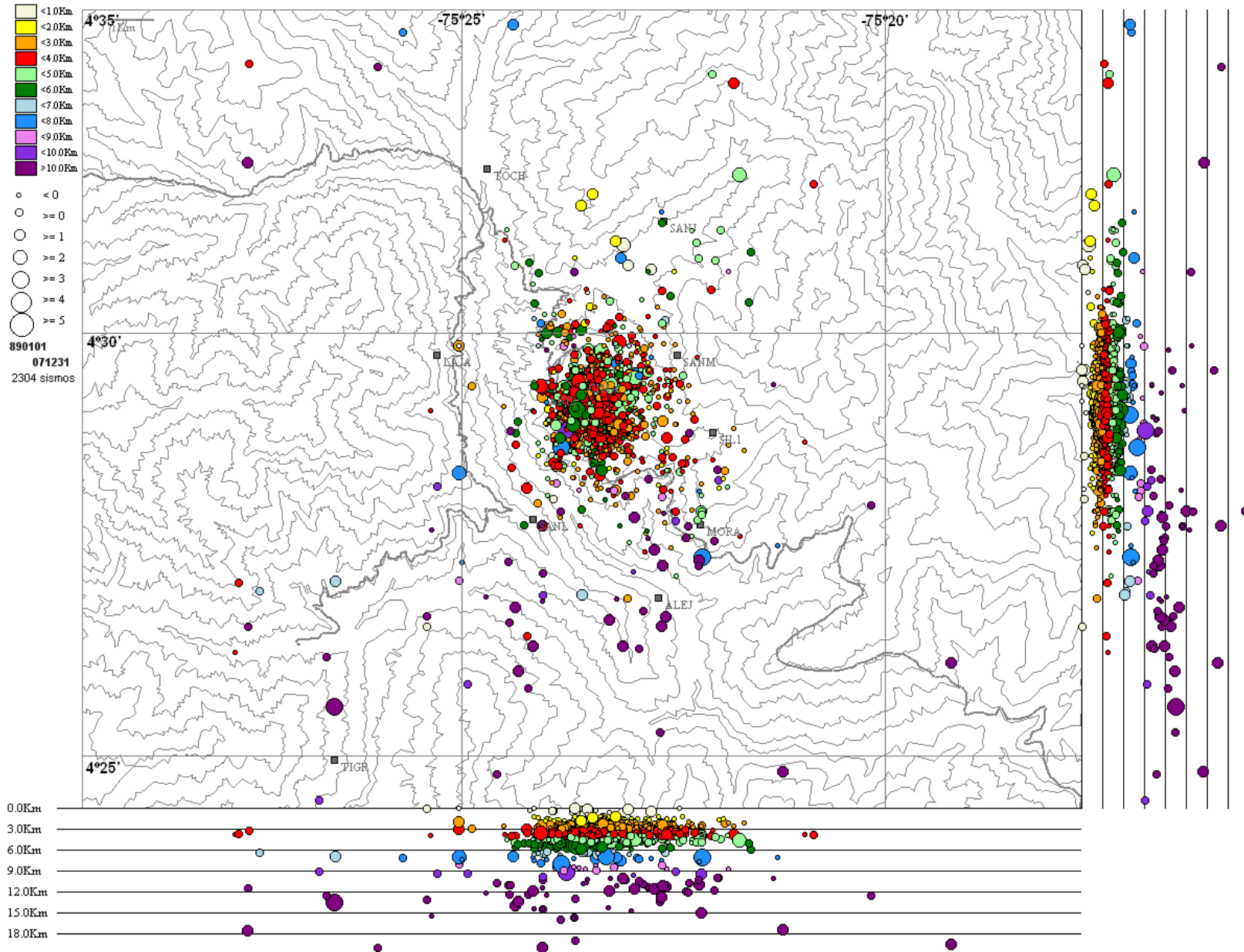






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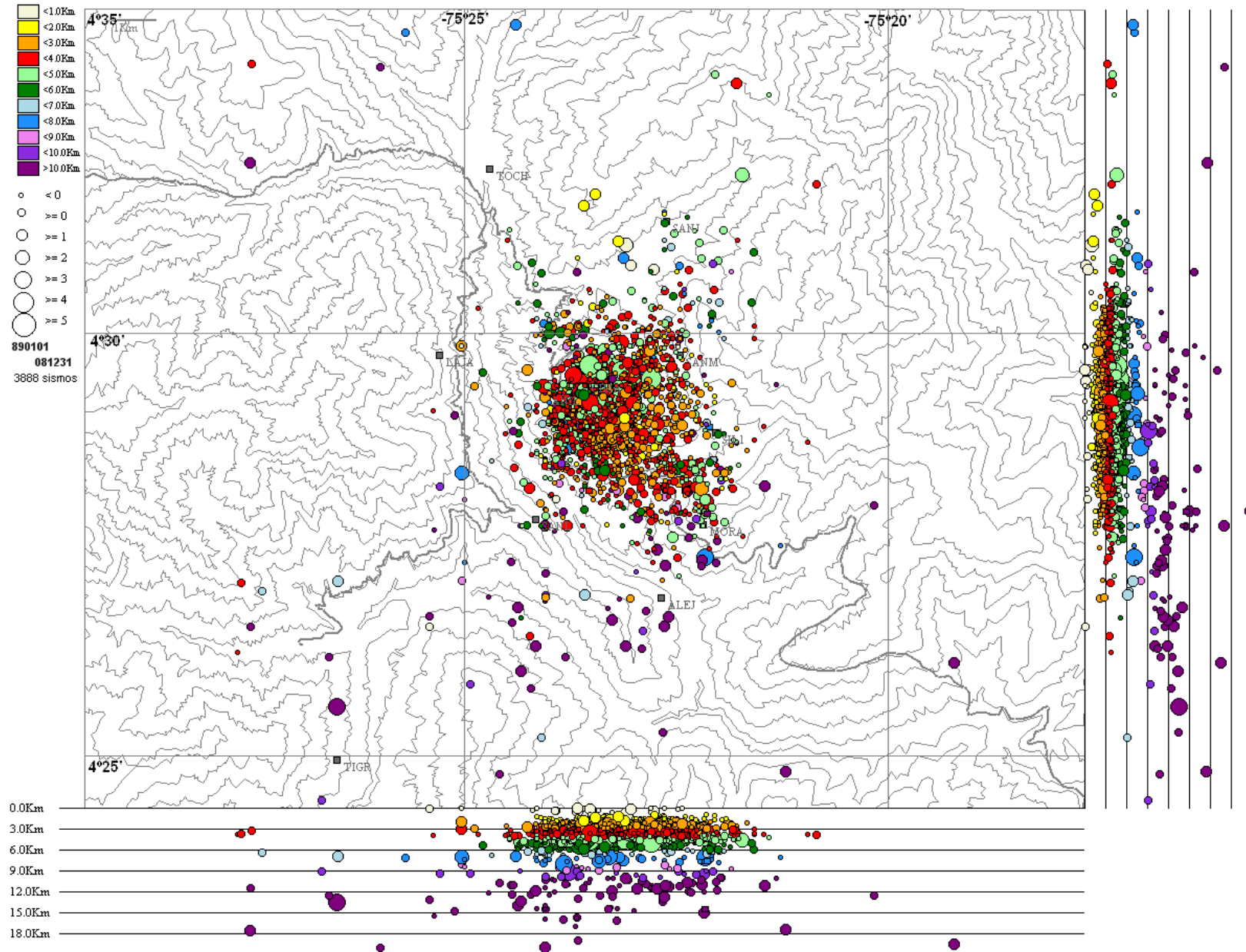
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# 2008

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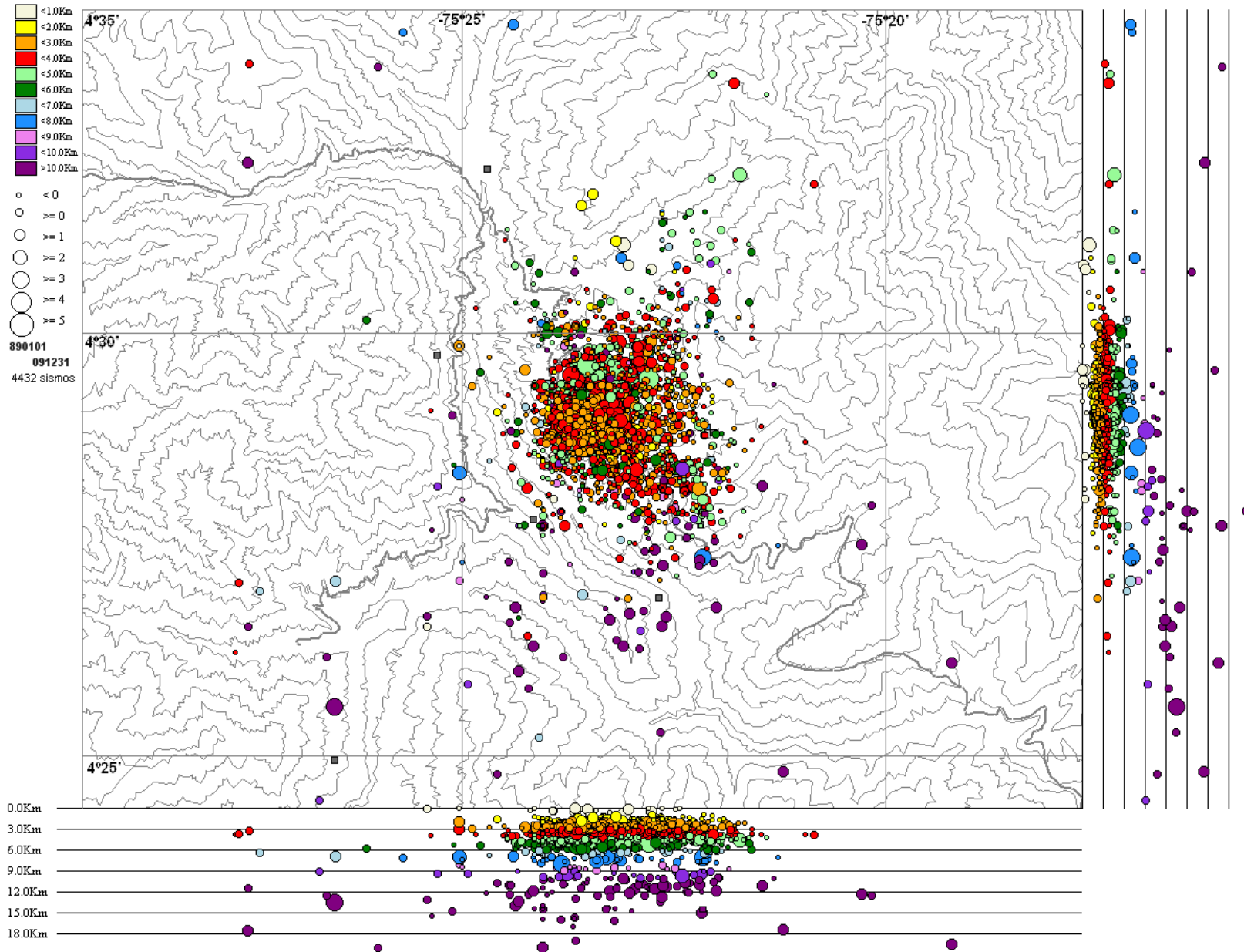






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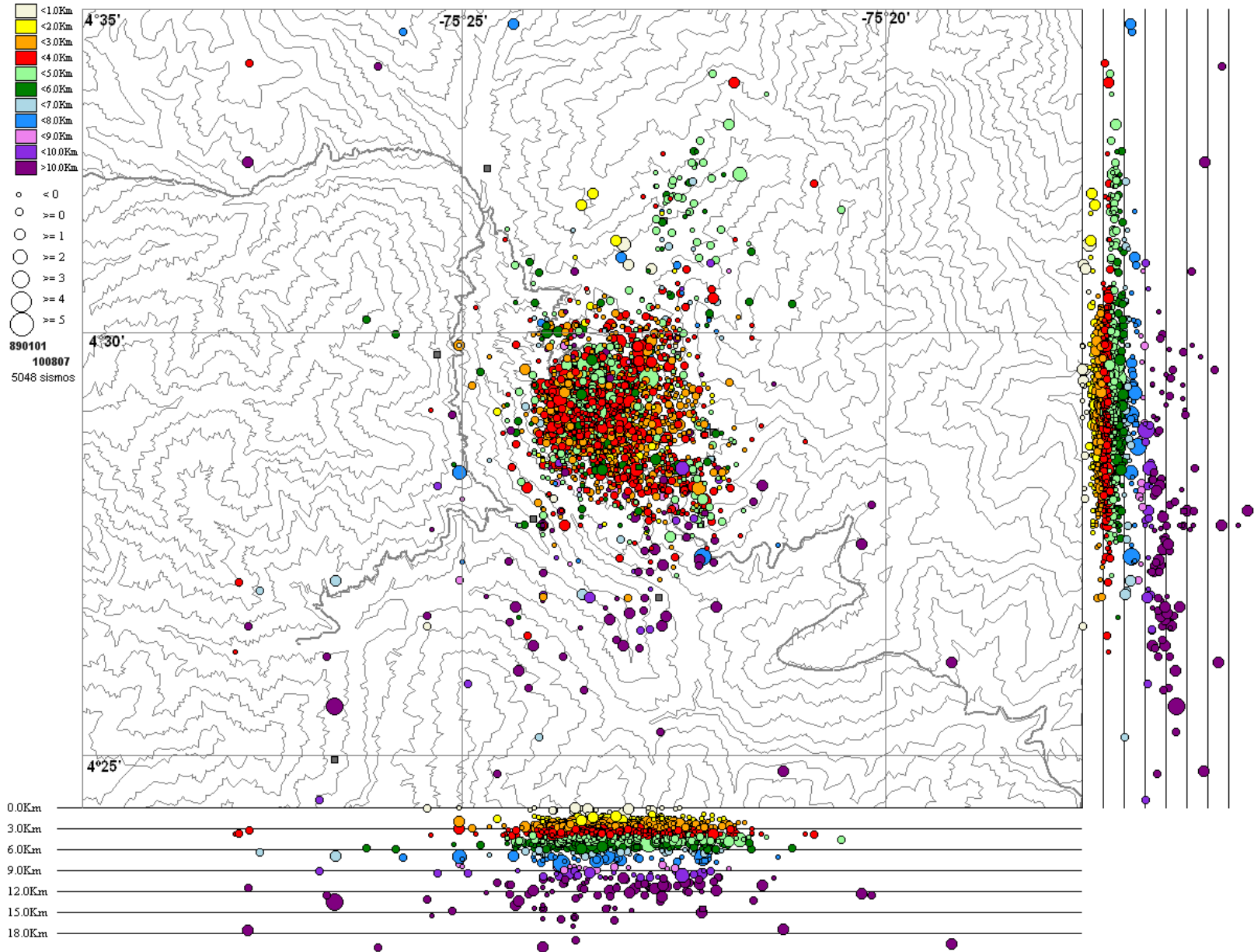
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# 2010

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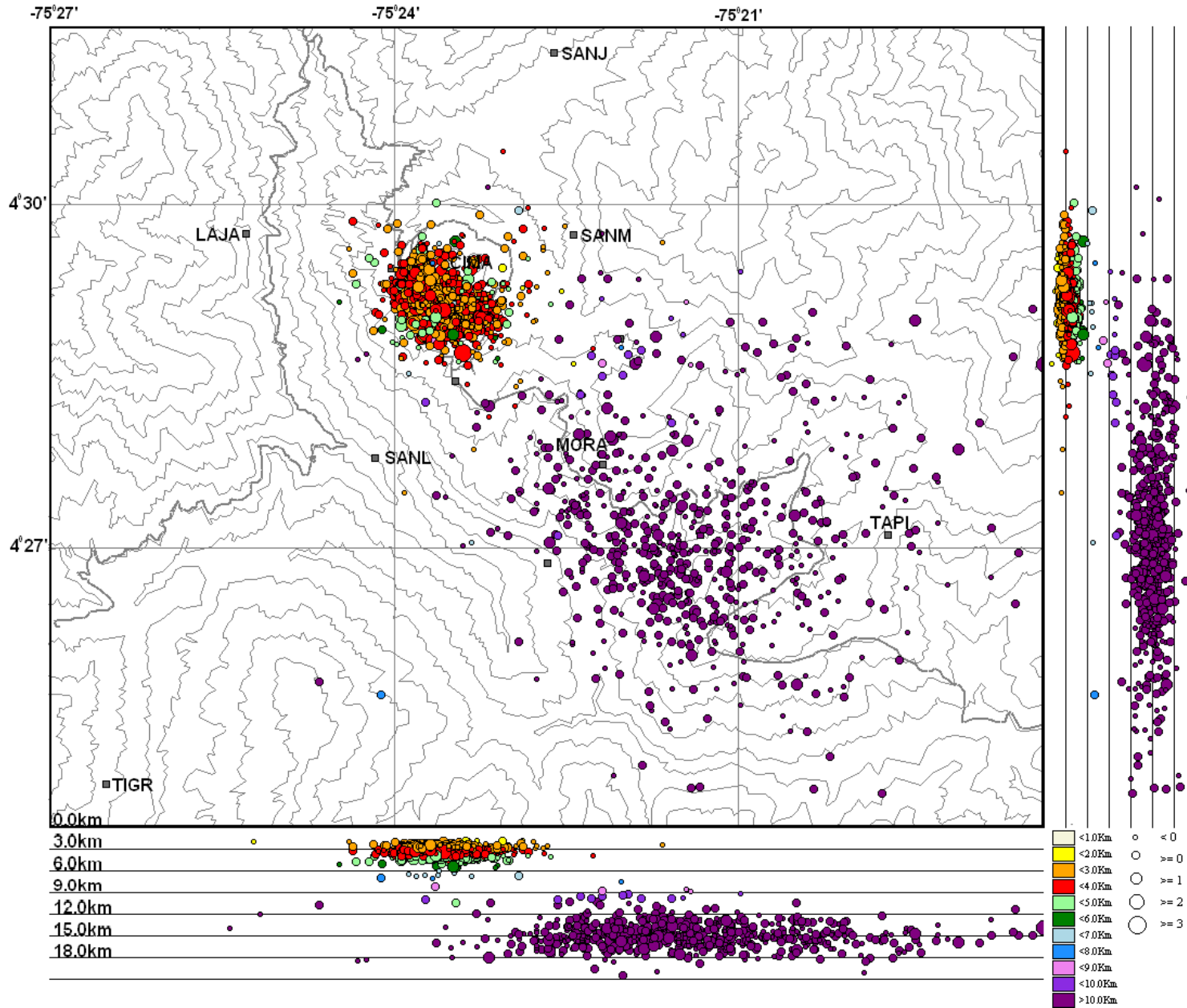






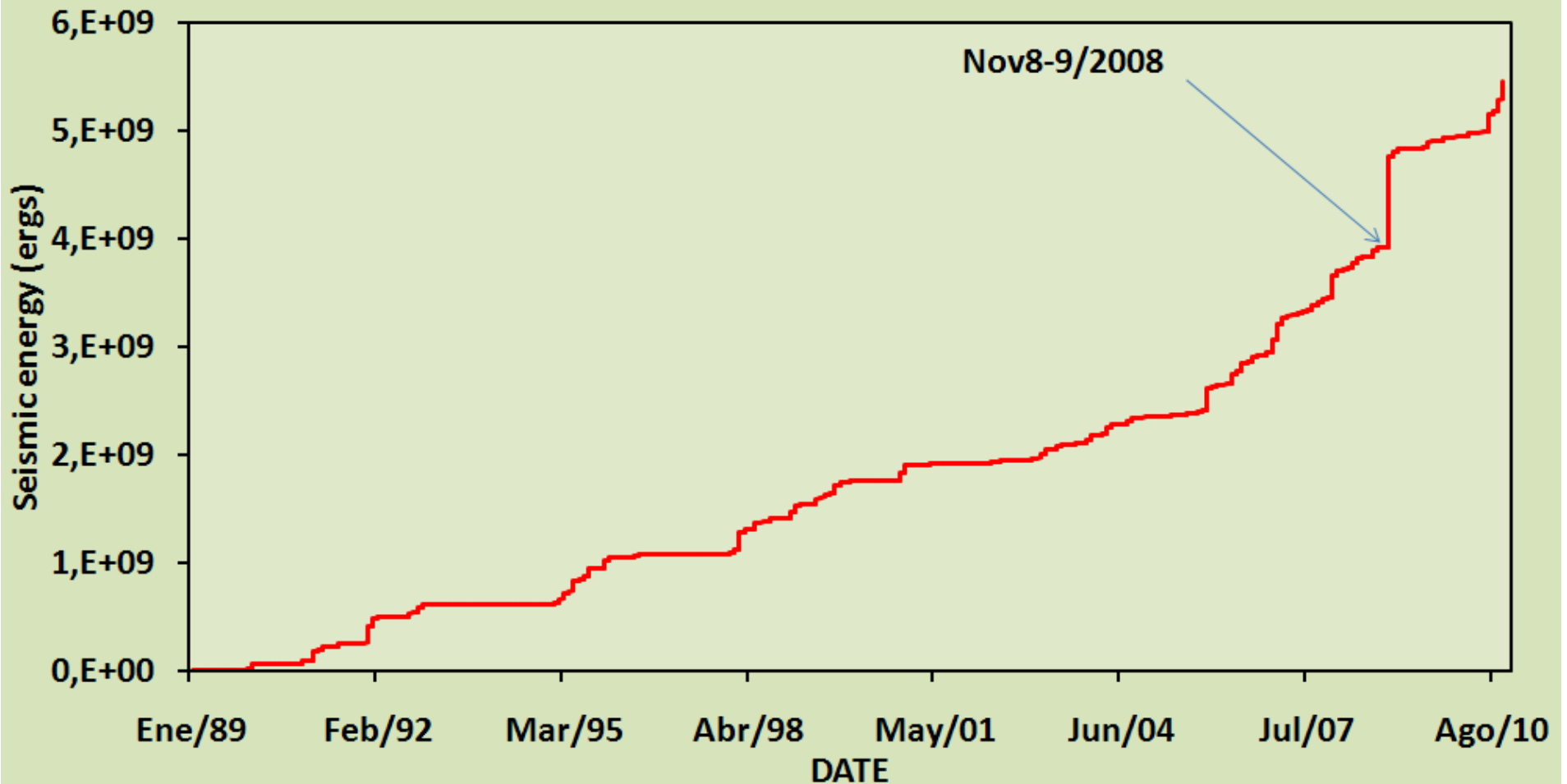
# 2010

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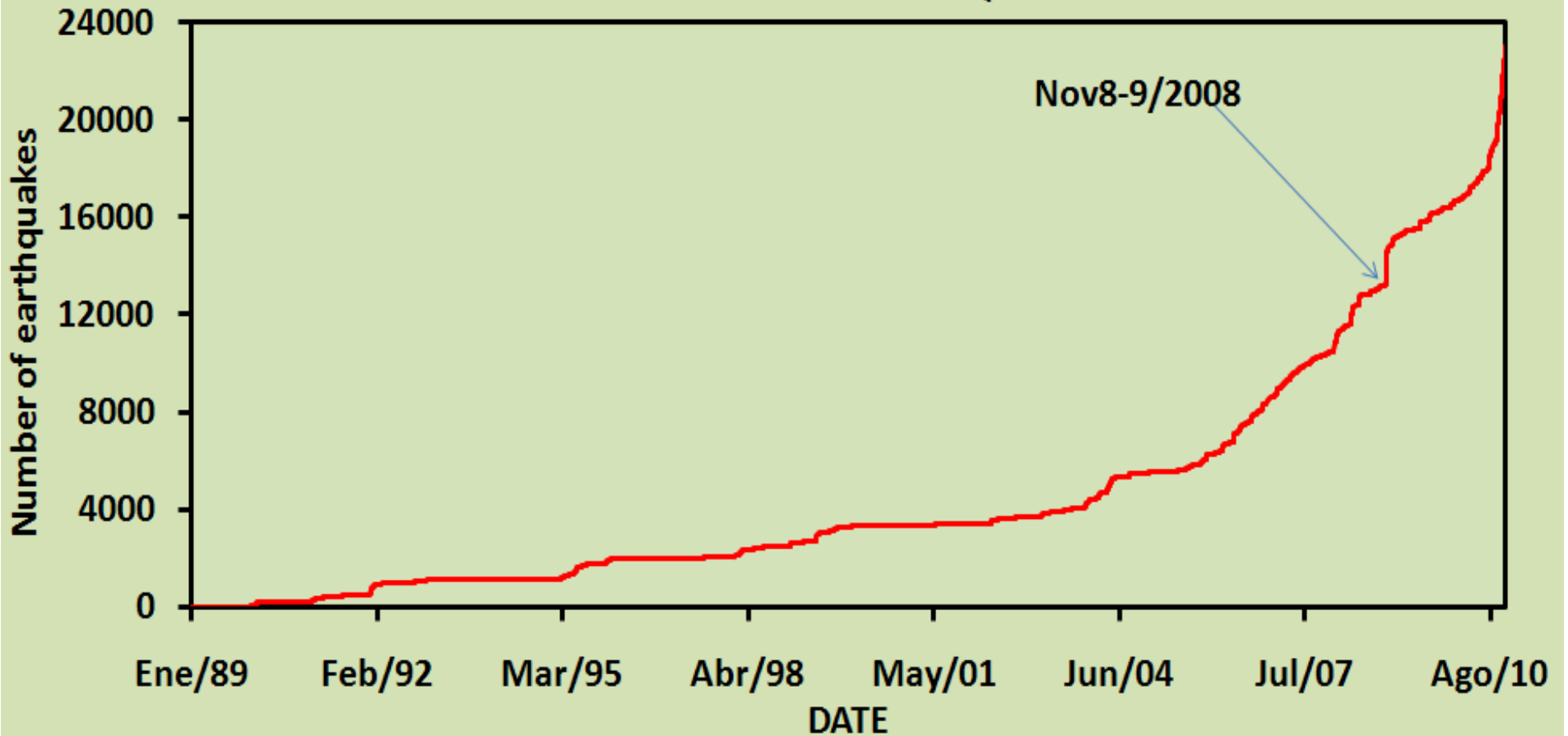
### CUMULATED DAILY SEISMIC ENERGY CMV 1989 - 2010







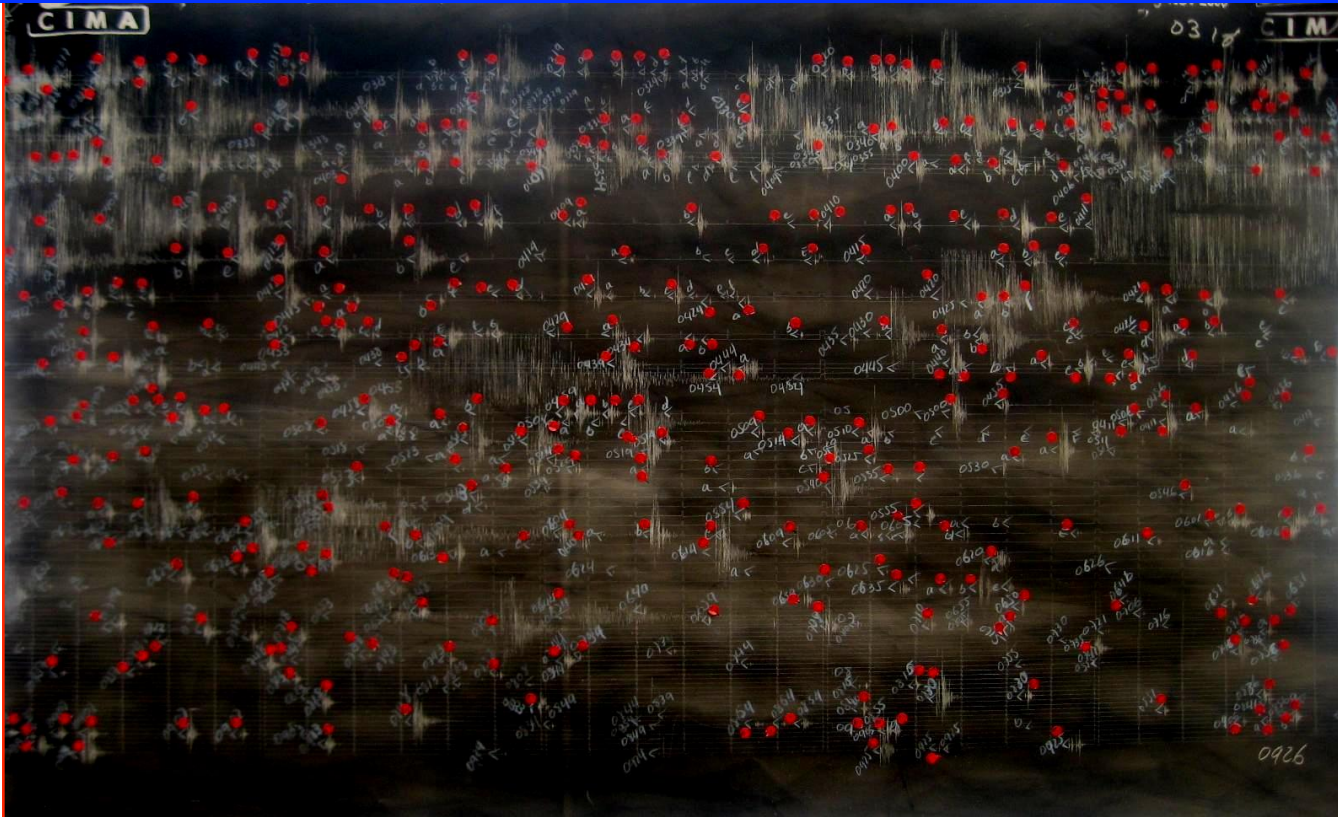
### CUMULATED DAILY NUMBER OF EARTHQUAKES CMV 1989 - 2010





# SWARMS

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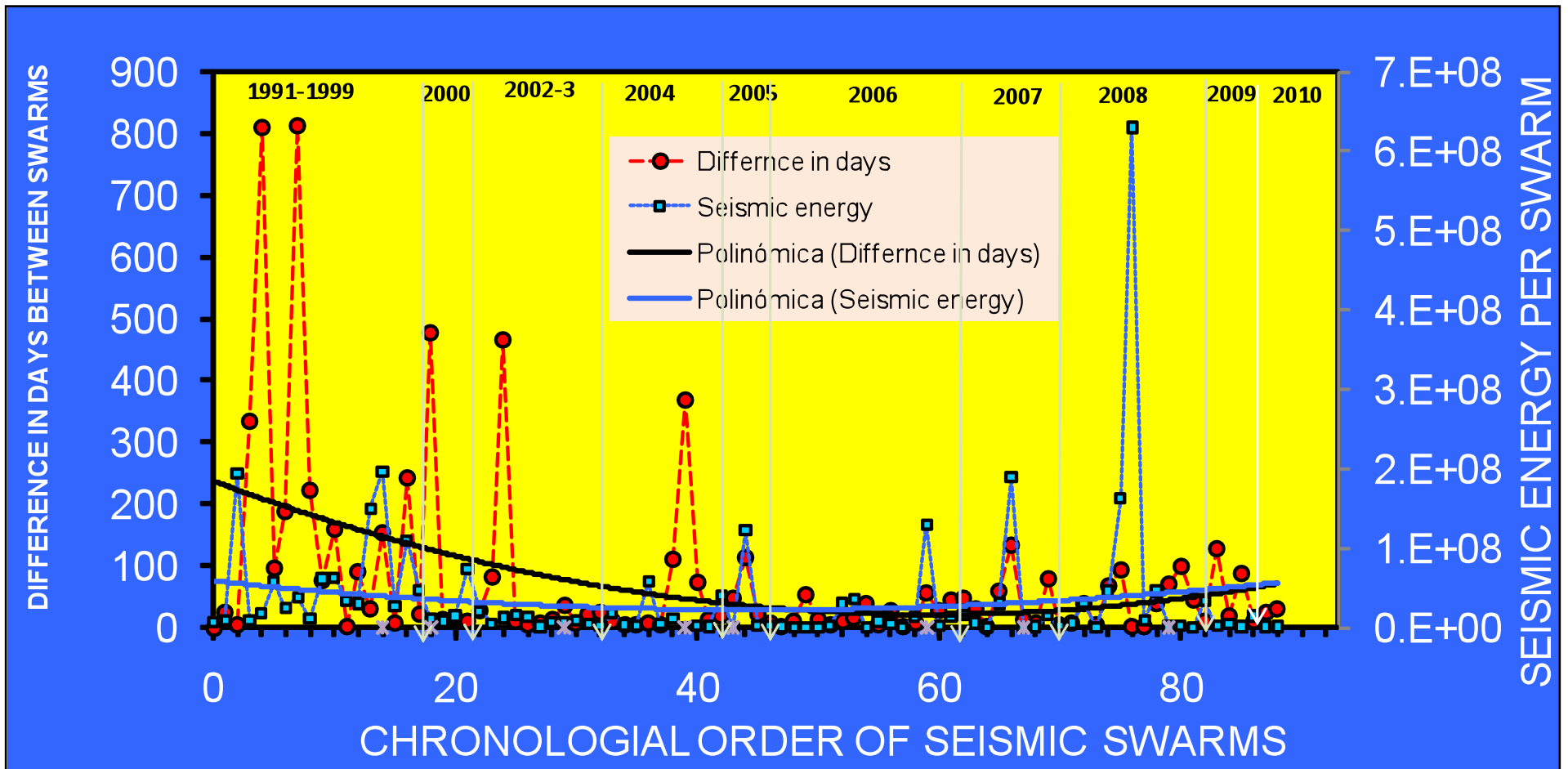


**SEISMIC SWARM, NOV-9-2008**





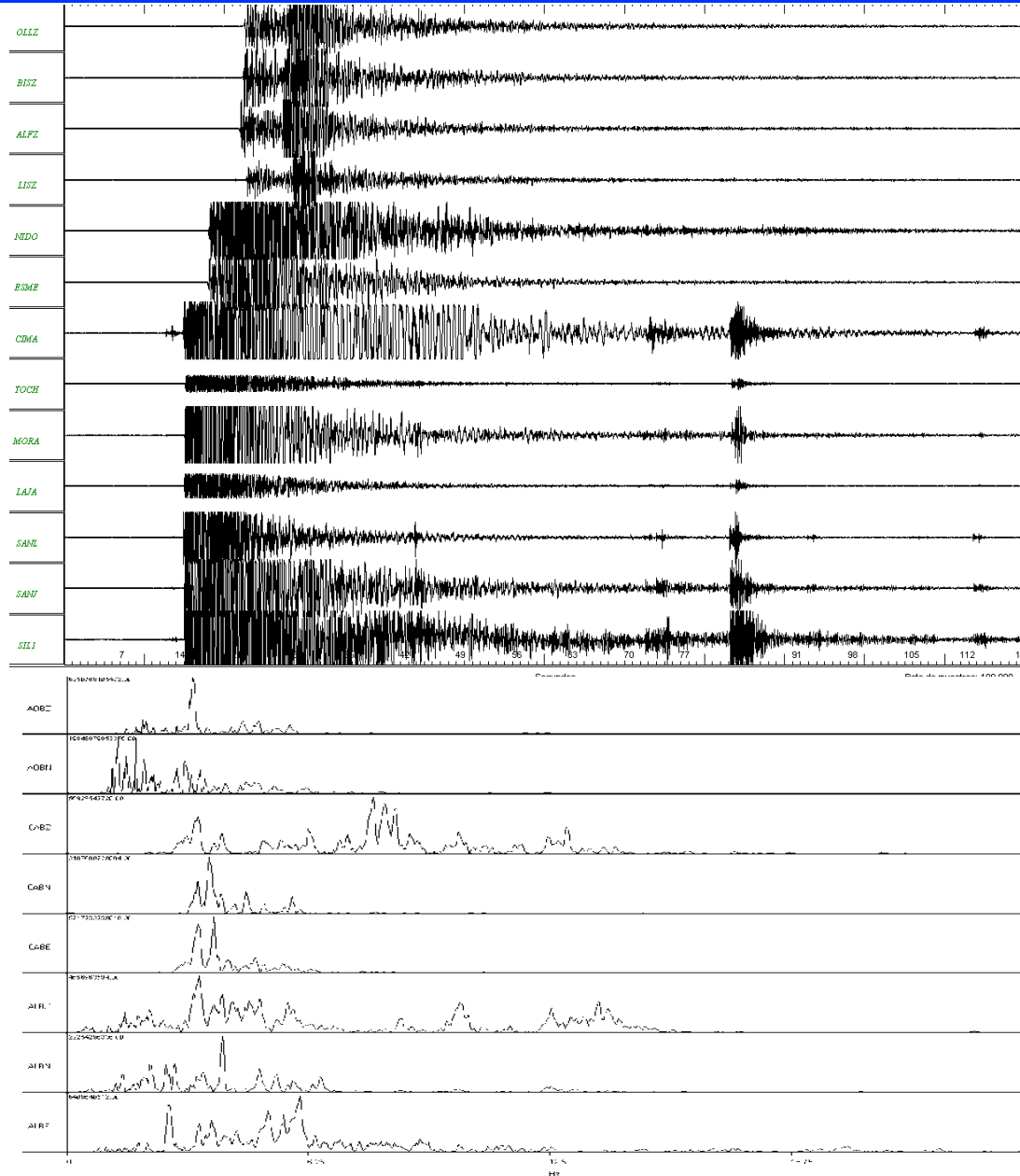
## RELATIONSHIP BETWEEN SEISMIC SWARMS AND ENERGY WITH TIME





# EQK, NOV-9-2008. 3:43 am. $M_L=4.6$

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EFFECTS, NOV-9-2008. 3:43 am.  $M_L=4.3-4.6$





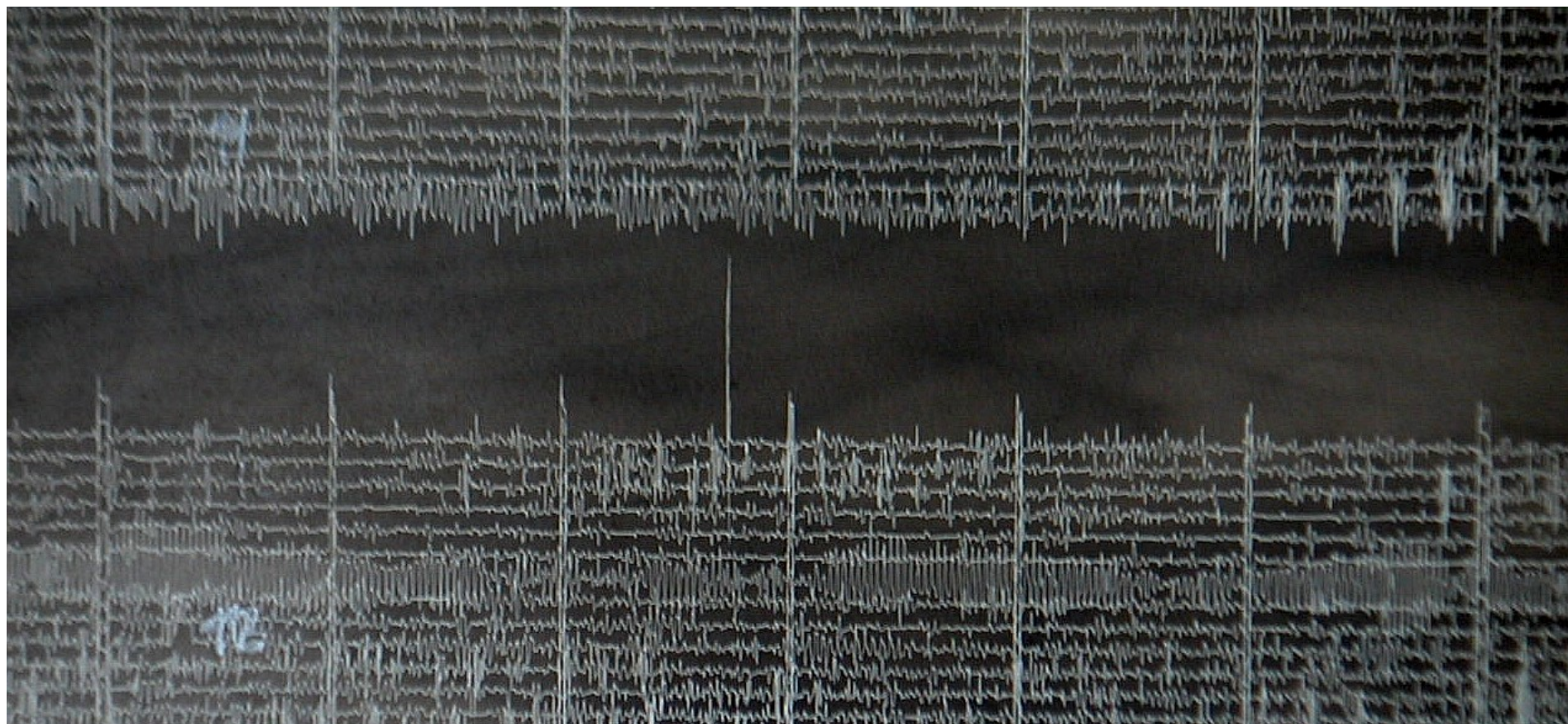


# VOLCANIC TREMOR August / 2004

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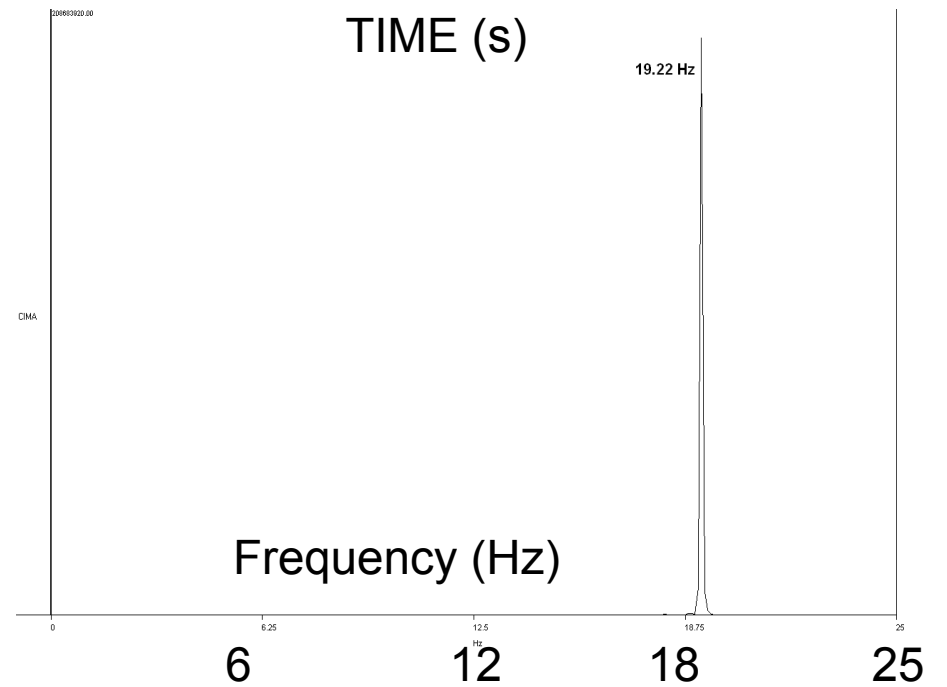
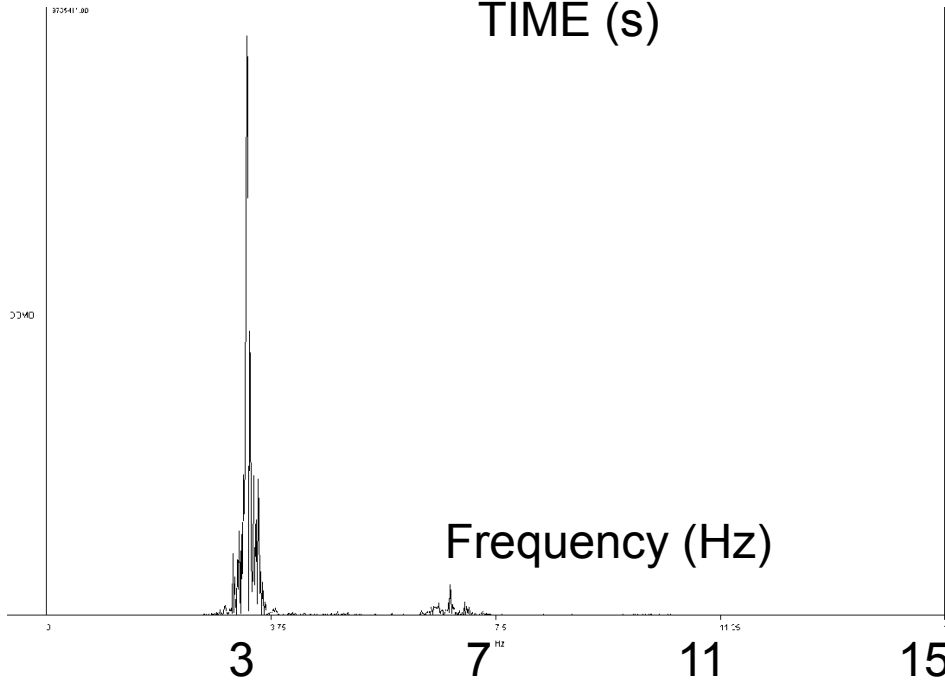
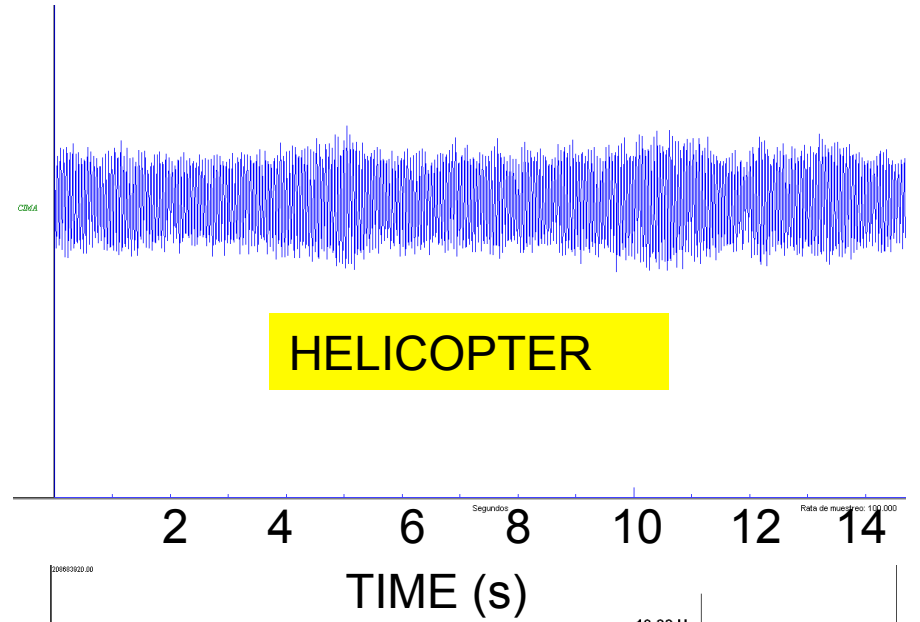
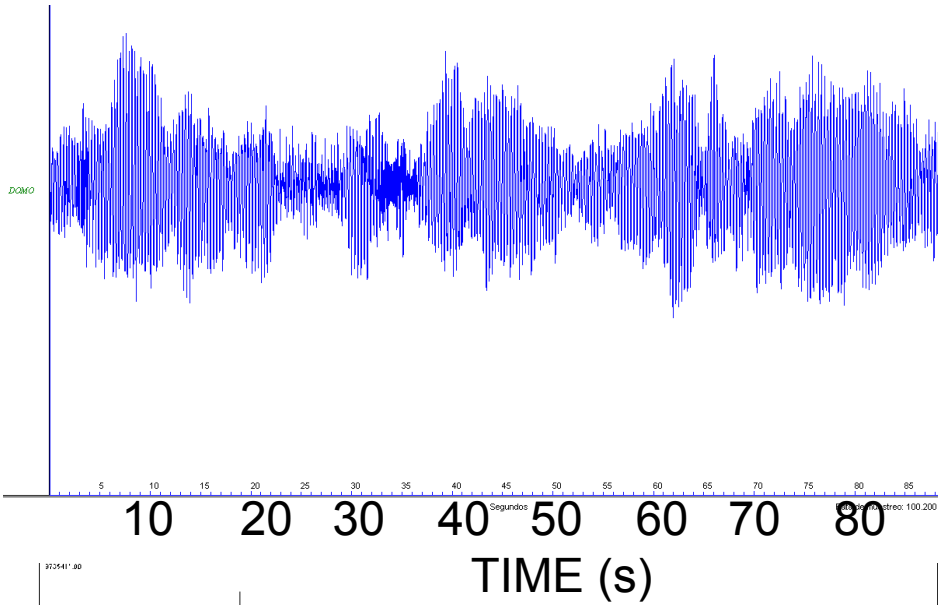
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# VOLCANIC TREMOR

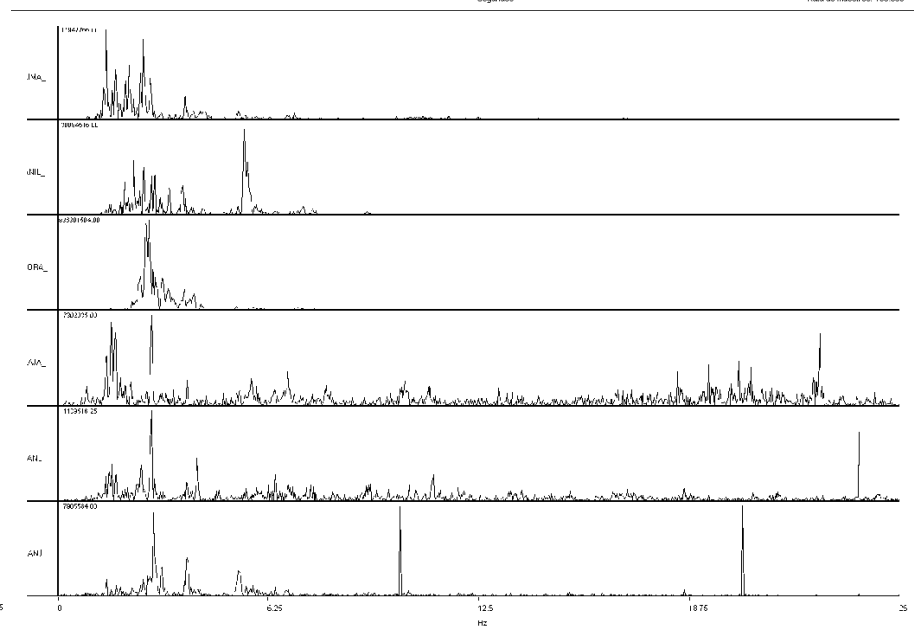
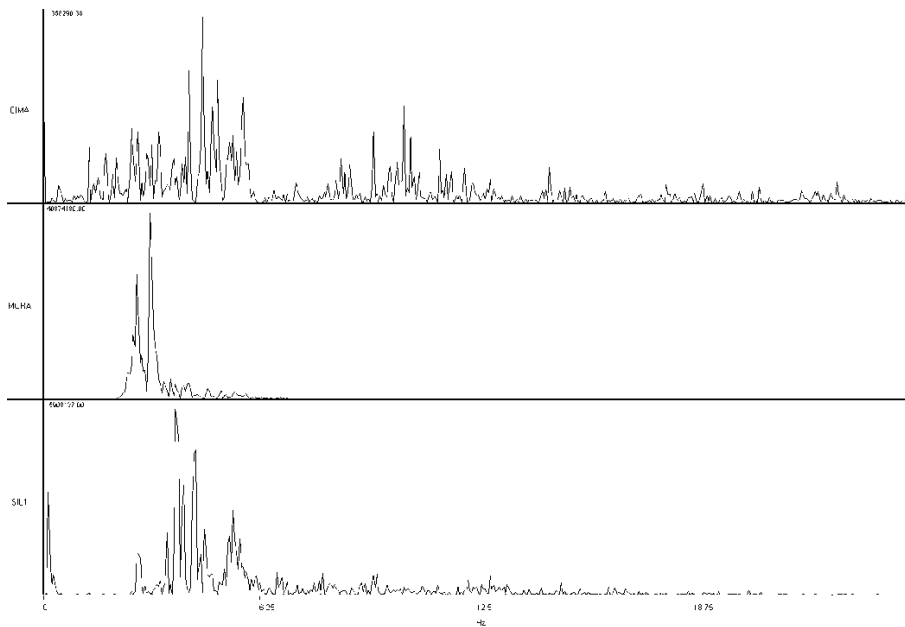
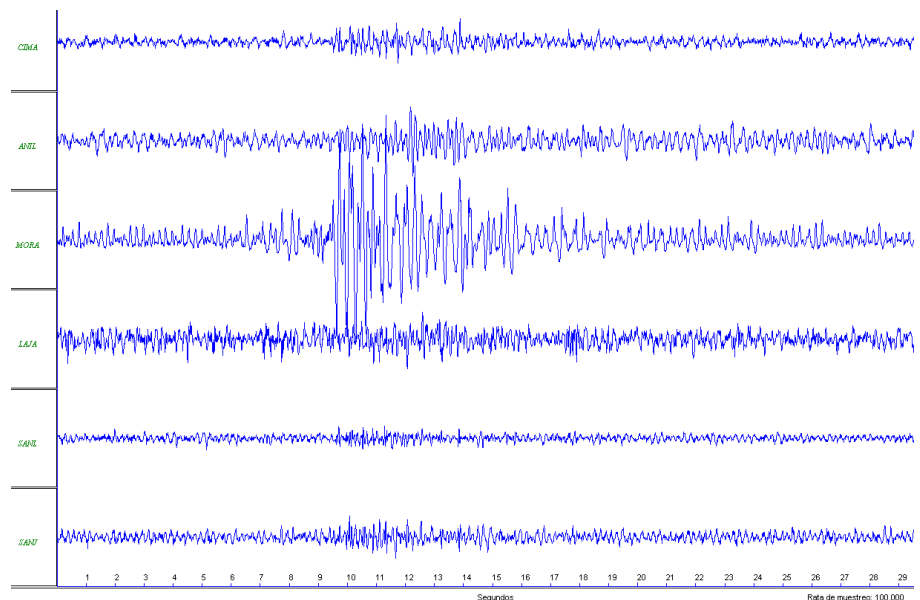
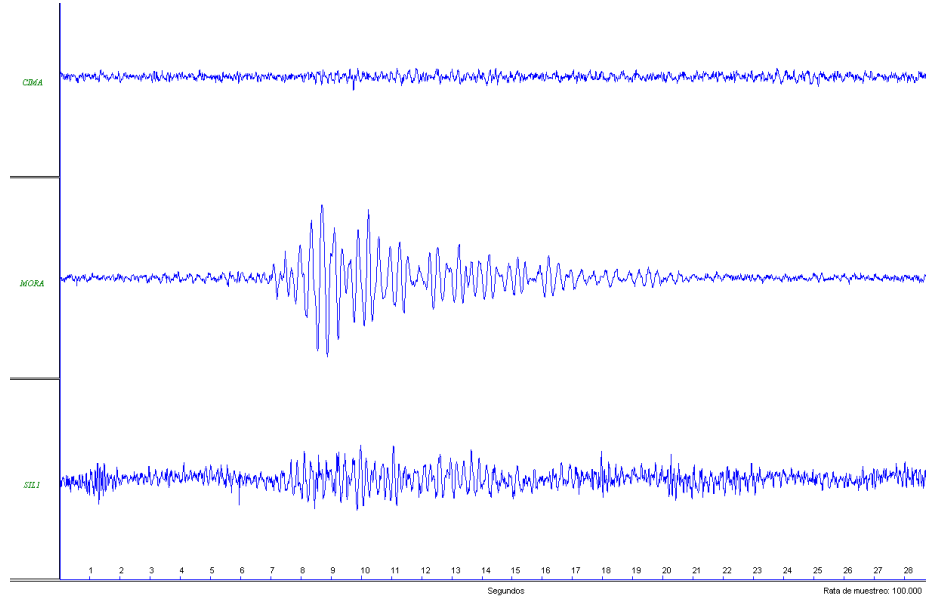
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# OTHER SEIMIC SIGNALS

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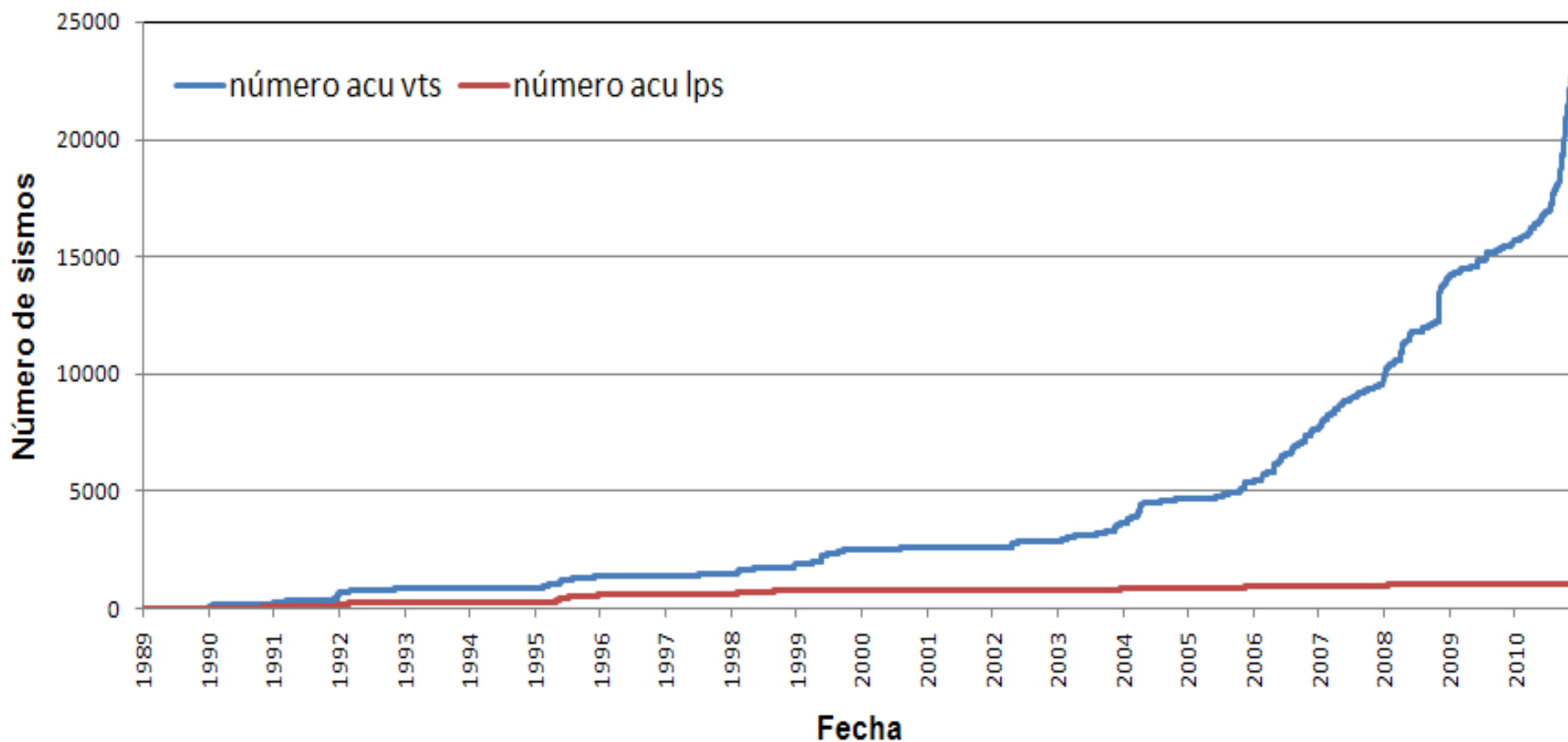




# OTHER SEIMIC SIGNALS

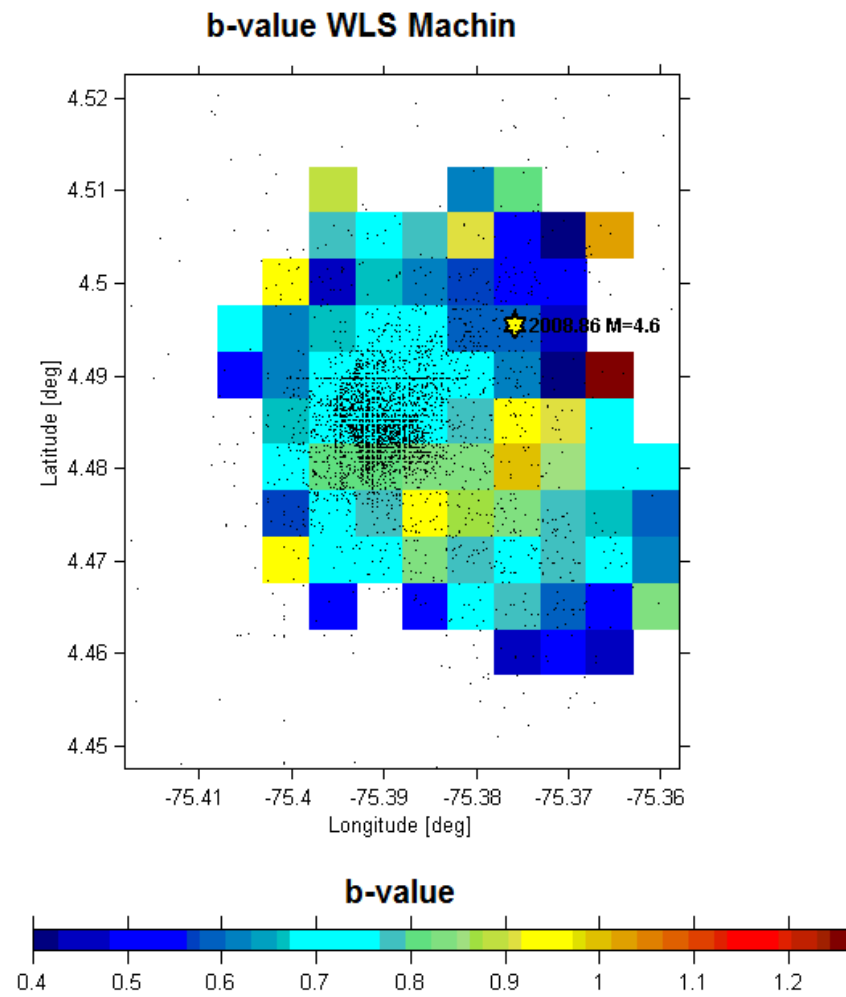
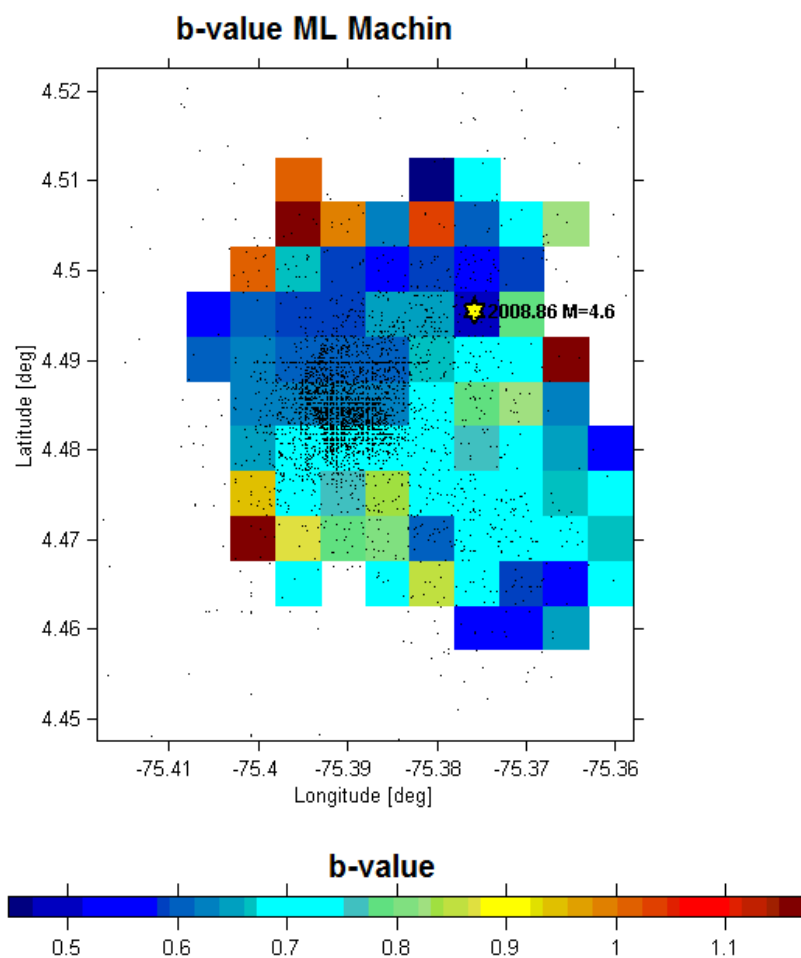
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## Número de sismos acumulado vts y lps VCM 1989 - 2011





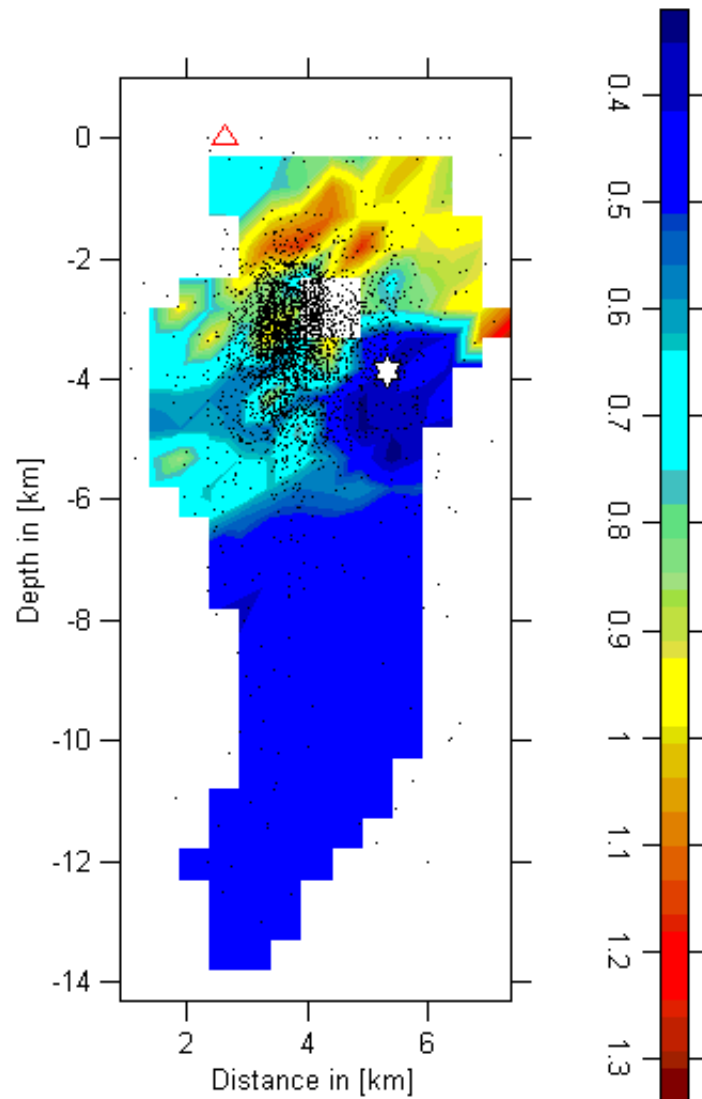
## SPATIAL DISTRIBUTION b VALUE - PROFILES





## SPATIAL DISTRIBUTION b VALUE - PROFILES

Valor-b WLS. Volcán Cerro Machín



Valor-b ML. Volcán Cerro Machín

